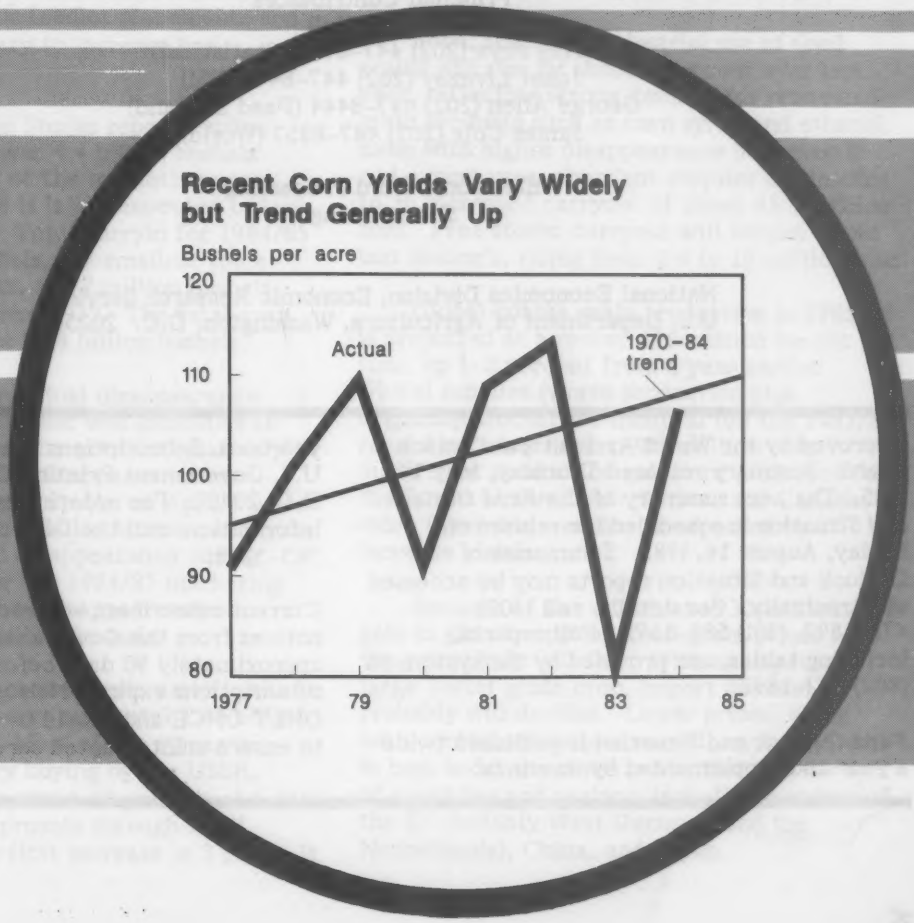
United States
Department of
Agriculture

Economic
Research
Service

FdS-296
May 1985

Feed

Outlook and Situation Report



CONTENTS

Situation Coordinator
David B. Hull (202) 447–8776

Principal Contributors
David B. Hull
Shirley Frye (202) 447–8776 (Statistical)
Janet Livezey (202) 447–8444 (FSI)
George Allen (202) 447–8444 (Feed Demand)
James Cole (202) 447–8857 (World)

Electronic Word Processing
Shawn Irving

National Economics Division, Economic Research Service
U.S. Department of Agriculture, Washington, D.C. 20250

Approved by the World Agricultural Outlook Board. Summary released Thursday, May 16, 1985. The next summary of the *Feed Outlook and Situation* is scheduled for release on Friday, August 16, 1985. Summaries of Outlook and Situation reports may be accessed electronically. For details, call (402) 472–1892; (301) 588–1572. Full reports, including tables, are provided by the system on (402) 472–1892.

Feed Outlook and Situation is published twice a year and supplemented by an annual yearbook. Subscriptions are available from the U.S. Government Printing Office, Washington, D.C. 20402. For ordering and price information, call the GPO order desk at (202) 783–3238.

Current subscribers will receive renewal notices from the Government Printing Office approximately 90 days before their subscriptions expire. Notices will be sent ONLY ONCE and should be returned promptly to ensure uninterrupted service.

SUMMARY

Current projections place the 1985 U.S. corn crop at 7.9 billion bushels. Added to carryout from 1984/85, the crop would push total supplies next season to just over 9 billion bushels. Domestic use may hold steady or increase modestly, but without a repeat of this year's heavy buying by the USSR, exports are expected to decline. Carryout for 1985/86 is therefore likely to climb to about 1.9 billion bushels, 27 percent of use. This volume is expected to hold corn prices near the loan rate, or a range of $2.50 to $2.70 per bushel.

Feed costs continue well below the highs set in 1983/84 and prospects for 1985 and 1986 suggest this will continue. Grain consuming animal units (GCAU's) for 1984/85 are up around 360,000 from last year to 78.6 million. GCAU's from cattle on feed increased by 1.3 million, more than offsetting a decline from hogs of about 760,000. Current indicators suggest GCAU's will decline slightly in 1985/86, due largely to a reduced number of steers and heifers for feedlot placements and the lag time necessary to increase hog production.

The latest Grain Stocks report implies corn disappearance was 4.4 billion bushels during the first half of the marketing year. However, annual use is is not expected to top the 1982/83 record. Total carryin for 1984/85 was 723 million bushels, the smallest since 1976, and free stocks, at 97 million bushels, were the tightest since 1937. The total corn supply for 1984/85 is 8.38 billion bushels.

Corn feed and residual disappearance during October-December was indicated at 1,680 million bushels, the greatest quarterly corn feed and residual disappearance on record. However, corn stocks on April 1 were estimated at almost 4 billion bushels, implying more moderate feed disappearance during January-March. For the 1984/85 marketing year, feed and residual disappearance is expected to be 4.2 billion bushels.

Despite strong corn exports early in the marketing year, exports may total 1.95 billion bushels this season. Most of the strength stemmed from heavy buying by the USSR, which accounted for about 40 percent of total export sales and shipments through April. Although this is the first increase in 3 years, it is still 20 percent below the record exports of the late 1970's.

Corn food, seed, and industrial use is forecast to increase by close to 80 million bushels in 1984/85. About 40 million bushels will be used for stepped-up high fructose corn syrup production and about 40 million for increased output of fuel alcohol. Barley, oats, and sorghum use in food products is extremely small compared to that for corn. At least 40 million bushels of oats are used in cereal and snack products but less than 5 million bushels of barley and sorghum are processed as food.

Feed grain disappearance for 1984/85 is forecast at 223 million tons, about the same as two seasons ago. Large Soviet purchases have boosted exports to 58.3 million tons, while feed and residual disappearance is expected to rise about 13 percent from the depressed level of 1983/84. Plentiful supplies and low prices have increased feeding rates of most grains.

Food, seed, and industrial use of feed grains will rise by about 7 percent over last year, reflecting strong demand for processed grain products such as corn syrup and ethanol. Even with higher disappearance in domestic and export uses, abundant supplies are leading to an increased carryout of about 45.5 million tons. Free stocks carryout will almost triple last season's, rising from 6.4 to 18 million tons.

Global coarse grain production in 1985/86 is projected at a record 816 million metric tons, up 1-2 percent from a year earlier. Global supplies (world production plus beginning stocks) are likely to top the 1982/83 record and may exceed 900 million tons. Significant production gains are projected for the Soviet Union, South Africa, and Canada, as more favorable weather is expected to increase yields.

Because of the anticipated 33-million-ton gain in global supplies, feed grain prices for the year likely will fall. With an expected large Soviet grain crop, import demand probably will decline. Lower prices, along with continued world economic recovery, will in turn boost livestock production in a number of countries and regions, including portions of the EC (notably West Germany and the Netherlands), China, and Japan.

FEED GRAIN SUPPLY AND USE

Estimates of the domestic 1984 feed grain crops in the *January Crop Production Summary* indicate production of 236 million metric tons, up 73 percent from 1983, and about 1.8 percent higher than previously reported. It was the fourth largest feed grain crop in the last 10 years. The harvest brings total feed grain supplies for 1984/85 to 269 million tons, compared with 234 million in 1983. These plentiful supplies are leading to lower prices, larger carryout, and greater domestic and export use in the 1984/85 marketing year.

Feed grain disappearance for 1984/85 is forecast at 223 million tons, about the level for two seasons ago. Heavy buying by selected importers, such as the USSR, has boosted exports to 58.3 million tons, the first increase in 3 years. Feed and residual disappearance is expected to rise about 13 percent over the depressed 1983/84 level despite the small rise (1 percent) in grain consuming animal units (GCAU's). This level of feeding is above 1981/82 but below 1982/83. Plentiful supplies and low prices will increase feeding rates of most coarse grains.

Food, seed, and industrial (FSI) use of feed grains will rise by about 7 percent over last year, reflecting strong demand for processed grain products such as corn syrup and ethanol. Even with higher disappearance in domestic and export uses, the plentiful supplies are leading to an increased carryout of about 45.5 million tons. This feed grain carryout is about 20 percent of use, up from last year's 31.5 million tons, or about 16 percent of use. Farmer–owned reserve (FOR) stocks of feed grains are anticipated to hold steady at 17.5 million tons, while Government–owned stocks will increase to 10 million. Free stocks carryout will almost triple last season's, rising from 6.4 to 18 million tons.

In February, growers said they intended to plant 125 million acres to feed grains in 1985, about 3 percent above last year. Even with the heavy 1985 feed grain program signup (63 percent), these planting intentions could be realized and, with favorable weather, total feed grain supplies could rise by more than 8 percent.

Prospects point to a decline in demand in the 1985/86 marketing year. Exports are likely to decline if world production of grains is as great as expected. Some modest growth in FSI and feed use is expected, but that is not enough to offset stagnation in export markets. Feed grain stocks are expected to climb to 69 million tons by the end of the 1985/86 marketing year, about the same as in 1981/82. Before that, the last time stocks reached these burdensome levels was the early 1960's. Free stocks will be the highest since 1977. These supplies will tend to keep farm prices near loan rates, and encourage farmer participation in Government price support and acreage reduction programs.

Producers with mature FOR loans will be given the opportunity to repledge their grain as collateral under a new Special Producer Storage Loan Program. The new loan will mature after 12 months, or on demand by the Commodity Credit Corporation (CCC). However, the loan may be repaid any time without penalty. Interest will be charged, but advance storage payments will be made to producers. Finally, growers can still forfeit their grain in lieu of repaying the loans. Since the new loan gives farmers another option when their FOR loans mature, grain should remain under private control longer, but may be forfeited to the CCC eventually.

The 1985 feed grain crops will be the last produced under provisions of the Agriculture and Food Act of 1981. During recent weeks, a dozen or more bills have been introduced in either the Senate or the House to amend or replace the 1981 Act and previous legislation. Although provisions of the bills vary, they generally have some common themes, namely, that price and income supports should be related to market prices and that the United States should more aggressively promote exports.

The final outcome of the farm bill debate is far from certain. Significant changes in price support levels, stock management policies, and other items could have important effects on the grain markets for 1986/87 and years to follow. And, if a consensus emerges this year, paticularly one which calls for immediate and significant changes in program

provisions, the use and pricing of the 1985/86 crop would be affected as well.

In mid-May, the Secretary of Agriculture announced a $2-billion export enhancement program. The program will offer Government-owned commodities as bonuses to U.S. exporters to expand sales of U.S. agricultural products in targeted markets.

Corn

The April 1 stocks report implies corn disappearance was 4.4 billion bushels for the first half of the marketing year. However, annual use is not expected to top the 1982/83 record.

The 1984 corn crop was 7.66 billion bushels, up 83 percent from the drought- and PIK-reduced 1983 crop. The small 1983 crop led to a drastic reduction in supplies throughout the year. Total carryout was 723 million bushels, the smallest since 1976, and free stocks at 97 million bushels were the tightest since 1937. Total corn supply for 1984/85 is 8.38 billion bushels.

Indicated feed and residual disappearance during October-December was 1,680 million bushels, which is the greatest quarterly corn feed and residual disappearance on record. However, the most recent Grain Stocks report estimates April 1 corn stocks at almost 4 billion bushels. The implied feed disappearance for the January-March quarter is a more moderate 1,151 million bushels. For the 1984/85 marketing year, feed and residual disappearance is expected to be 4.2 billion bushels. This is about 12 percent higher than last year's depressed level, despite only a minor increase in the GCAU's on hand.

It is likely that extremely tight free stocks of old-crop corn induced heavy feeding of 1984-crop corn as it was harvested. This would tend to inflate the fall quarter feed use estimate by including new-crop corn that was fed prior to October 1.

Despite strong corn exports early in the marketing year, exports may total only 1.95 billion bushels this season. Most of the strength stemmed from heavy buying by the USSR, which accounted for about 40 percent of total export sales and shipments through April. Although this is the first increase after a 3-year decline, it is still 20 percent below the record exports of the late 1970's.

Prices received by farmers have been running 16 to 20 percent below year-earlier levels. The low month so far this season was November at $2.55 per bushel--level with the national loan rate. Farm prices reached a high of $2.68 (preliminary) in April--actually a little less than the typical price rise through the marketing year. For the first 7 months of the marketing year, prices have averaged $2.62 per bushel.

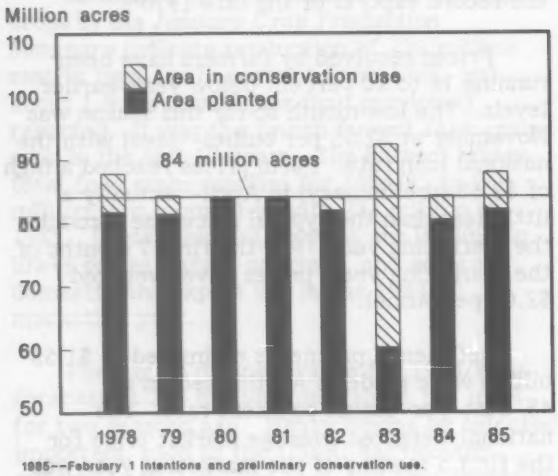
Deficiency payments estimated at $1.55 billion were made in April based on a 43-cent-per-bushel payment rate. The national weighted average market price for the first 5 months of the marketing year was $2.60 per bushel. Thus, the deficiency payment rate approached the maximum 48 cents, the difference between the target price of $3.03 and the loan rate of $2.55.

The February *Prospective Plantings* reported grower intentions to plant 82 million acres of corn in 1985, up 1.6 million from last year. Of the increase, 900,000 acres are in Corn Belt States; Iowa shows the largest increase with 250,000 acres. Although corn prices are projected to be lower this year than last, soybean prices have fallen relatively more. This factor, plus the guaranteed target price for the 1985 feed grains program participants, tends to make corn more attractive.

The grower intentions are not entirely consistent with enrollment in the 1985 feed grains acreage reduction program. Signup of corn area was 71 percent of the eligible base of 83.3 million acres. Even so, corn area planted may reach the 82 million acres intended. For the last 5 years (except during PIK), conservation use plus planted area has remained near 84 million acres. This year, with participation in the acreage reduction program at 71 percent, the conservation use should be 5 to 6 million acres.

In 1984, complying base was 42.6 million acres, 52.7 percent of the total. Potential planted area on farms with base was 76.5 million acres--3.9 million less than actual area planted. Participants planted only 34.2 million acres, compared with a potential of

Domestic Corn Area Remains Near 84 Million Acres



1985--February 1 intentions and preliminary conservation use.

38.3 million. In contrast, nonparticipants planted 46.2 million acres, compared with a potential of 38.2 million. The excess represents plantings on farms without certified base and plantings beyond the base on noncomplying farms.

There are offsetting factors that make it difficult to anticipate how much soybean area will be switched to corn. The soybean-corn price ratio in Central Illinois is about 2.2--a ratio that favors corn to soybeans. However, the credit problems that have faced farmers this spring would suggest production strategies that conserve cash. Since soybeans require less cash to plant than corn, this aspect favors soybeans.

If all farms enrolled in the 1985 program comply, maximum plantings on complying farms will be 53 million acres. If the nonparticipating farms limit their plantings to base, those farms would plant 24.3 million acres for a total of about 77.4 million. The factors that will determine area in 1985 are the extent to which planting on participating farms will fall below potential, and the extent to which planting will occur on farms without base.

Current projections place the 1985 corn crop at 7.9 billion bushels next fall. Added to carryout from 1984/85, total supplies next season would amount to just over 9 billion bushels. While domestic use may hold steady or increase modestly, exports are expected to decline without a repeat of this year's heavy buying by the USSR. Carryout for 1985/86 is therefore projected to climb to about 1.9 billion bushels, 27 percent of use. This level of supply is expected to hold corn prices near the loan rate, or a range of $2.50 to $2.70.

Sorghum

The April 1 grain sorghum inventory of 481 million bushels reflects a disappearance of 636 million bushels for the first half of the marketing year, 43 percent greater than last season. The fall quarter saw record domestic

Actual and potential corn area planted

Region	1984 area					1985 potential area, base		
	Compliance		Noncompliance		Total actual planted	Compliance	Non-compliance	Total
	Potential	Actual	Potential	Actual				
	Thousand acres							
Corn Belt	19,680	18,054	16,809	18,997	37,050	27,037	9,276	36,313
Lake States	6,688	6,018	5,917	8,433	14,450	9,202	3,649	12,850
N. Plains	8,527	7,295	5,259	5,525	12,820	10,857	3,146	14,003
Other	3,402	2,848	10,247	13,266	16,114	5,967	8,245	14,212
United States	38,297	34,215	38,231	46,220	80,434	53,063	24,315	77,378

and export disappearance, although the rate of use declined seasonally through the January-March quarter. The 481-million-bushel supply will be more than adequate to meet requirements for the second half of the marketing year.

The 1984 grain sorghum crop was estimated at 866 million bushels, 78 percent greater than last year, but only 4 percent above 1982. When added to the carryin of 251 million bushels, the harvest brought total supply to 1,117 million bushels, 26 percent larger than 1983/84, and almost as great as 1982/83.

Because of the record feed and residual disappearance early in the season, the projected total for the year is 525 million bushels. Exports are projected to reach 275 million bushels for the marketing year, bolstered by Asian importers switching from corn to other feed grains.

Prices received by farmers have been running 13 to 20 percent below year-earlier levels. The low month so far this season was November at $2.26 per bushel. Farm prices dipped in February, but generally increased through the year to a high of $2.44 (preliminary) in April. For the first 7 months of the marketing year, prices averaged $2.33 per bushel, or $4.16 per cwt.

Deficiency payments estimated at $150 million were made in April based on a 46-cent-per-bushel payment rate. The national weighted average market price for the first 5 months of the marketing year was $2.30 per bushel. Thus, the deficiency payment rate of 46 cents per bushel was set at the maximum--the difference between the target price of $2.88 and the loan rate of $2.42.

The February *Prospective Plantings* report showed a continuation in the recent trend of sorghum area to move eastward from the Central and Southern Plains. In 1982, 74 percent of total sorghum area was planted in Kansas, Nebraska, and Texas. In 1985, intentions for these states declined to 61 percent, while the share in Alabama, Arkansas, Mississippi, Missouri, Tennessee, and Illinois jumped from 10 to 25 percent. Sorghum is replacing soybeans in these States. Both sorghum and soybeans may be double-cropped with wheat, and sorghum is more drought-resistant. In addition, growers with livestock can make direct use of grain sorghum. For the United States, growers intended to plant 17.9 million acres. Of the 19.9 million base acres, growers enrolled 56 percent in the 1985-crop program. The 10-percent acreage reduction requirement could idle 1.1 million acres of potential sorghum area.

Production for 1985/86 is projected at 885 million bushels, for a total supply of 1,182 million. Domestic use and exports are expected to remain steady, giving a total use of 820 million bushels. At 362 million bushels, projected ending stocks will reach 44 percent of use. These supplies, plus abundant supplies of other feed grains, will keep the season average price near the loan, or a range of $2.30 to 2.50 per bushel. As of mid-March, wetness had delayed early sorghum planting in Texas. As spring advanced, conditions improved, but the late planting may adversely affect yields in early sorghum areas, although planting was not entirely prevented as previously feared.

Barley

As the end of the marketing year for barley approaches, supplies are still plentiful. April 1 stocks of 319 million bushels should amply provide for domestic and export uses, leaving a projected carryout of 246 million.

Production in 1984 was a record 597 million bushels, up 17 percent from 1983. With record production, and disappearance about the same as last year, stocks are accumulating to 45 percent of use. Prices received by farmers this marketing year have ranged from 15 percent above a year-earlier last July to 14 percent below a year-earlier in April. The highest price so far this season occurred last June at $2.61 per bushel. Farm prices declined to a low of $2.17 in March. For the first 11 months of the marketing year, prices averaged $2.29 per bushel, compared with $2.50 last season.

Deficiency payments estimated at $50 million were made in April based on a 26-cent-per-bushel payment rate. The national weighted average market price for

the first 5 months of the marketing year (June through October) was $2.34 per bushel, above the loan rate of $2.08, but below the target price of $2.60.

Despite depressed prices, grower intentions for 1985 indicate a 4-percent rise in area planted, to 12.4 million acres. Total disappearance is expected to about equal 1984/85 because of weaker export demand for the 1985/86 marketing year. Yearend carryout is projected to rise to 336 million bushels, about 62 percent of use. This level of stocks is expected to keep the season average price at or below the current year's $2.30 per bushel.

Oats

In contrast to the other three feed grains, April 1 stocks of oats, at 256 million bushels, were 5 percent below a year earlier. Production for 1984 was 472 million bushels, 1 percent less than 1983 and the second smallest oat crop on record. As a conseqence, yearend carryout is projected to decline to 177 million bushels, and prices have matched or exceeded year-earlier levels.

Imports continue to play an important role in oat supplies. The combination of a relatively high domestic price and the elevated exchange rate of the U.S. dollar makes our domestic market attractive to oat exporters. Last year, Canada was the major source of oat imports. This year, most imports are from Northern Europe.

Prices received by farmers this marketing year have ranged from 20 percent above a year earlier last June to 10 percent below a year earlier in April. The high month so far this season was last June at $1.80 per bushel. Farm prices dipped through the summer as harvest progressed, increased in the winter, and fell again through the spring. The low for the season occurred in April at (preliminary) $1.63 per bushel. For the first 11 months of the marketing year, prices averaged $1.71 per bushel.

For the first 5 months of the marketing year (June through October), the national weighted average market price was $1.70 per bushel, or 10 cents above the $1.60 target price. Therefore, no deficiency payments were made to oat producers.

Producers surveyed for the February *Prospective Plantings* report intended to plant 12.9 million acres in 1985, up 5 percent from last year. Intended plantings were up in most of the larger producing States except Texas, where intentions were only 83 percent of last year's area. Although these intentions were 36 percent below the 1983 plantings, a large part of the 1983 area was planted as a cover crop for conservation use during PIK.

Production of oats in 1985 is projected at 510 million bushels, in line with the increase in planting intentions. With carryin and imports, total supply is projected at 707 million bushels. Total use is expected to about equal 1984/85 disappearance. Yearend carryout on May 31 is projected at 200 million bushels. The season average price will be pressured to stay below this year's level, in the range of $1.45 to $1.65 per bushel.

Hay

January 1 hay stocks were 100.6 million short tons, reflecting a rebuilding of stocks from last year's tight market. A record 150.8 million tons were harvested last fall, 10 million above 1983. This harvest offset the small carryin of 20.1 million tons and brought marketing year supplies to 170.9 million. Disappearance from May to January was 70.3 million tons, down 9 million from a year earlier, and about the same as 2 years ago.

Hay (all): Acreage, supply, and disappearance, 1982-85

Item	Units	82/83	83/84	84/85 1/
Acreage harvested	Mil. acres	59.8	59.7	61.6
Yield per acre	Tons	2.50	2.36	2.45
Carryover (May 1)	Mil. short tons	25.0	28.1	20.1
Production	"	149.2	140.8	150.8
Supply	"	174.2	168.9	170.9
Disappearance	"	146.1	148.8	144.0
Roughage-consuming animal units (RCAU)	Mil. units	90.2	89.3	85.9
Supply per RCAU	Tons	1.93	1.89	1.99
Disappearance per RCAU	"	1.62	1.67	1.68

1/ Forecast.

May 1 stocks were reported at about 27 million tons, representing a more comfortable level of carryover, which is reflected in lower prices. Pasture and range conditions have been rated about normal.

Prices received by farmers during the past marketing year have ranged from almost 10 percent above a year earlier last May to 10 percent below a year earlier in March. The high month of the 1984/85 season was last May at $85 per ton. As harvest progressed, and the need to supplement pasture and forage feeding declined, prices fell to a low of $71.70 in August and September. The simple average price received for the season based on preliminary monthly prices (May-April) was $74.50 per ton.

Farmers' intentions are to increase area harvested in 1985 by about 1 percent to 62.3 million acres. Normal weather this summer will lead to a hay crop of about 150 million tons. Disappearance should amount to about 140 million tons because of fewer roughage consuming animal units in 1985/86. With strong production and carryin, and weaker demand, stocks could climb to 37 million tons, and the average price would decline $5-$10 per ton for the season.

FOOD AND INDUSTRIAL DEMAND

Corn Products

Corn food, seed, and industrial (FSI) use is forecast to increase by close to 80 million bushels in 1984/85. About 40 million bushels will be used for stepped-up high fructose corn syrup (HFCS) production and about 40 million for increased fuel alcohol production (see special article in this issue).

Barley, Sorghum, and Oat Products

Barley, oats, and sorghum use in food products is extremely small compared to that for corn. At least 40 million bushels of oats are used in cereal and snack products, but less than 5 million bushels of barley and sorghum are processed as food.

Malting barley is the major grain used in making alcoholic beverages. Since 1981/82, barley use in beer production has declined from 148 million bushels to 140 million. This drop has occurred because of flattening beer demand, declining barley use per barrel due to improved, more efficient varieties, and a consumer switch from full-bodied beers to light, which use more corn or rice and less barley.

Corn: Food, seed, and industrial use 1/

Product	81/82	82/83	83/84	84/85*	85/86*
			Million bushels		
Wet-milled 2/	510	535	590	630	650
Dry-milled 3/	163	168	164	161	160
Alcohol 4/	120	180	200	240	280
Seed	19	15	19	19	19
Total	812	898	973	1,050	1,110

1/ Year beginning October 1. 2/ HFCS, glucose, dextrose, and starch. 3/ Includes alkaline cooked products for Mexican foods and corn snacks. Dry-milled products include grits, meal, and flour. 4/ Fuel, industrial, and beverage alcohol. *Forecast.

Feed Grain Use in Alcoholic Beverages

In tables 7 through 9 of this issue, grain use in alcoholic beverages is no longer reported. The data for grain used for fuel and alcoholic beverages as reported by the Bureau of Alcohol, Tobacco, and Firearms do not include details needed for the specific breakout. Reported grain use in alcoholic beverages and use for food and industrial products will subsequently be combined.

FEED DEMAND

Feed costs continue well below the highs set in 1983/84 and prospects for 1985 and 1986 suggest this will continue. Quarterly comparisons with last year's prices paid index point up these differences with forecasts for the 1985/86 quarters.

	1983/84	1984/85	1985/86
		1910-14=100	
Oct.-Dec.	566	491	475
Jan.-Mar.	568	486	490
Apr.-June	567	485	510
July-Sept.	529	495	500

Stocks of feed grains and wheat are more than adequate for the marketing year. With corn and sorghum plantings ahead of normal except in Texas, plentiful grain supplies and low prices remain in prospect for next year.

As of the second week of May, 17 major grain producing States had planted 78 percent of intended corn plantings, which is significantly above the average for this date. Sorghum planting in Texas was estimated over two-thirds complete. Planting in the 7 major sorghum producing States was underway with 31 percent seeded.

Pasture and range conditions were reported this spring as mostly "very good", except where moisture shortages existed in the Southeast. Hay supplies this past feeding season were more than sufficient for most areas. Continued feeding in the East was necessary this spring with the delayed pasture growth from prolonged cool and dry weather patterns which were finally broken during the first week of May.

Dairy Feeds

Milk cow feeding rates have been static due to Government efforts to reduce surplus dairy stocks. Although the dairy cow inventory has declined with increased cull rates, there is a potential for an increased milk cow herd because of inventory increases in replacement dairy animals. The ratio of dairy replacement heifers to dairy cows was record large at the beginning of 1985. If milk-feed price ratios remain favorable, the dairy milking herd probably will rise. Total concentrate dairy feed consumption in 1984/85 is estimated at 26.1 million tons for milk cows and 3.8 million tons for dairy replacement and dry stock. This compares with last year's estimated 29.6 million and 4.0 million tons, with the differences reflecting, in part, the Government's effort to reduce the Commodity Credit Corporation's surplus dairy stocks.

Beef Cattle Feeds

Beef cattle concentrate feed consumption for 1984/85 reflects increased placement of cattle on feed and heavier slaughter weights. The cow-calf herd inventory on January 1 fell to a 17-year low and feed concentrate consumption this feeding year will reflect this continued decline.

	1983/84	1984/85	Percent change
	1,000 metric tons		
Cattle on feed	28,966	31,081	+7
Beef cattle	9,165	8,668	-5

Hog Feeds

Barrow and gilt slaughter rates under Federal inspection since last fall show no significant gilt retention. This suggests a static situation in slaughter supplies for the balance of this year and extending into 1985/86. Despite relatively low corn and soybean meal prices, low hog prices have reduced average producer returns to below break-even. For this reason, the breeding herd has not expanded. Part of this behavior may be due to the need or desire of many producers to maintain cash flow volumes to service their financial commitments and obligations.

Total concentrate feed consumption by hogs during the current feeding year will be slightly less than 45 million tons, down from 47 million a year earlier.

Poultry Feeds

Broiler and turkey producers are expected to increase their feed use over last year's level. New estimates for broilers, which now include the breeder flock feed as a share of broiler feed totals, show concentrate feeds for 1984/85 at 18.3 million tons, compared with 17.8 million tons for 1983/84. Turkey concentrate feed consumption is expected to increase 4 percent over last year's nearly 4.5 million tons.

Layer feed consumption for 1984/85 is estimated at 10.8 million tons of concentrate feed mix, which excludes the allowances for broiler breeder flocks. During 1983/84, the Nation's layer flocks consumed an estimated 10.5 million tons, just slightly below the current year's total.

Other Livestock Feeds

The remaining classes of livestock, including sheep and lambs, horses, duck, geese, fish, dogs, cats, and other miscellaneous

species of animals, consumed 9.9 million tons during 1983/84. For 1984/85, this array of livestock is expected to consume 10.0 million tons of concentrate feeds. Totals cited for this group exclude conservative allowances for waste and other miscellaneous kinds of animals of 2 and 3.9 million tons for 1983/84 and 1984/85, respectively.

Grain-Consuming Animal Units (GCAU's)

GCAU's for 1984/85 are up 363,000 from last year to 78.6 million. GCAU's from cattle on feed increased by 1.3 million, more than offsetting the decline from hogs of 759,000. GCAU's from broilers and turkeys this year are also up from last year by 376,000 and 122,000, respectively. This more than offsets the drop from hens, pullets, and replacement layers, which show a decline of 151,000.

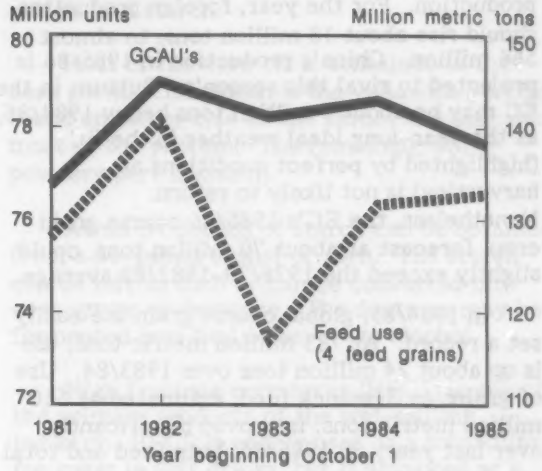
Current indicators suggest GCAU's will slightly decline next year from the current year's total. Fewer steers and heifers for feedlot placements and lag time necessary to increase hog production are two of the major factors contributing to fewer GCAU's during 1985/86.

High Protein Animal Units (HPAU's)

Total HPAU's for 1984/85 remain practically unchanged from 1983/84, but individual animal sectors show some movement. HPAU's from cattle on feed, broilers, turkeys, sheep, and replacement dairy animals are all on the plus side for 1984/85. Milk cows, layers and their replacements, on the other hand, are all below last year's levels.

With the decline in gluten feed exports and the reduced demand for protein feeds for hogs, prices for oilseed meals and grain protein have been at record lows. Continued low prices are in prospect as domestic and export demand remain soft. Some additional substitution in feed mixes are likely if gluten feed prices fail to strengthen. With energy feed prices expected to remain fairly steady, competition between surplus grains and other byproduct feed ingredients will prevent any sustained price strength in the different feed market sectors. Thus, until increased feeding activity works off surplus feed protein supplies worldwide, livestock and poultry producers may expect relatively low feed ingredient prices.

Grain Consuming Animal Units and Feed Use



WORLD COARSE GRAIN SITUATION

Global coarse grain production in 1985/86 is forecast at a record 816 million metric tons, up 1–2 percent from a year earlier. Global supplies (estimated by adding world production and beginning stocks) are likely to break the 1982/83 record, at just more than 900 million tons. Significant production gains are forecast for the Soviet Union, South Africa, and Canada, as more favorable weather is expected to boost yields.

Because of the anticipated 33-million-ton gain in global supplies, feed grain prices for the year will likely fall. Lower prices, along with continued global economic recovery, will in turn spur the demand for coarse grains and boost livestock production in some countries and regions including portions of the EC (notably West Germany and the Netherlands), China, and Japan. Difficulties and limits on plant expansion in other parts of the EC and East Asia, however, will limit animal inventory expansion, and combined with an expected higher Soviet grain crop, will likely reduce global import demand.

Coarse grain production in 1984/85 is forecast at 803 million tons, an increase of 17 percent from a year earlier, and the first time production has exceeded 800 million. China and EC coarse grain production soared to records because of excellent weather in both countries. Major agricultural policy changes

in China and the widespread use of high-yielding grains in the EC also augmented production. For the year, foreign production should rise about 18 million tons, to almost 566 million. China's production in 1985/86 is projected to rival this season's. Outturn in the EC may be about 5 million tons below 1984/85, as the year-long ideal weather in the EC (highlighted by perfect conditions at harvesting) is not likely to return. Nonetheless, the EC's 1985/86 coarse grain crop, forecast at about 70 million tons, could slightly exceed the 1978/79-1982/83 average.

In 1984/85, global coarse grain use easily set a record. At 783 million metric tons, use is up about 24 million tons over 1983/84. Use of grains as livestock feed, estimated at 510 million metric tons, improved significantly over last year. In 1985/86, both feed and total use should improve again, because large production is forecast and the resulting lower prices should lead to an increase in consumption.

Total coarse grain trade in 1984/85 (not including intra-EC trade) in 1984/85 is forecast at 102 million tons. Not since 1980/81 has it topped 100 million tons. The figure however is somewhat deceiving, because enormous, record-setting Soviet imports (estimated at 26 million tons for October-September 1984/85) revitalized the coarse grain market after 3 depressed years.

For 1985/86, global trade is projected to fall sharply. U.S. coarse grain exports at under 52 million tons are expected below the 58.3 million of 1984/85 because of continued strong competition from the EC and China, improved production and export prospects from Canada, and dramatically increased Soviet production prospects. Only a modest increase in coarse grain feed use is expected because growth of animal inventories in the USSR has recently slowed and total animal units are now equal to those of a year earlier--further depressing U.S. trade prospects.

Estimates of Corn Use for Major Food and Industrial Products

Janet Livezey
Economic Research Service

ABSTRACT: This article presents a historical breakout of corn use for food and industrial products. A discussion of the three major corn processing industries as well as the products they produce is included. Most of the growth in corn use is attributed to steadily increasing demand for high fructose corn syrup and fuel alcohol. The outlook is for continued growth, but at a slower pace.

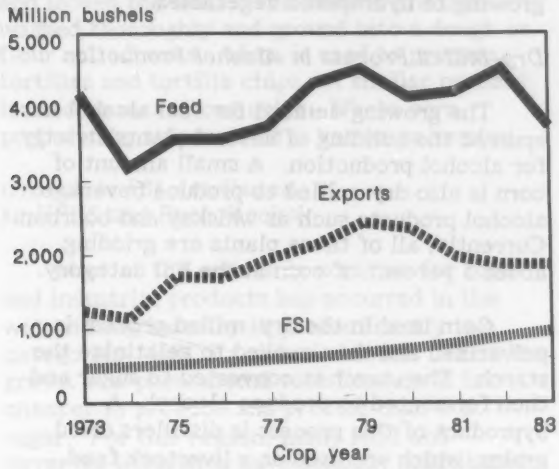
KEYWORDS: Corn, corn products, corn industries.

Food, seed, and industrial (FSI) use of corn has been increasing steadily for the past 10 years, and it now comprises at least 15 percent of total corn disappearance. Since more than 50 percent of corn fed to animals is consumed on farms where it is grown, FSI use accounts for as much as 20 percent of all corn sold.

All three categories of demand (feed use, exports, and FSI use) rose rapidly between 1974/75 and 1979/80, when total corn disappearance peaked. Between 1979/80 and 1983/84, exports and feed use fell by more than a billion bushels. FSI use, however, continued to grow, adding another 300 million bushels to total corn grind.

The steady growth of FSI corn use has generated much interest in just what constitutes this category of disappearance. A breakout of the FSI corn use estimate shows that there are three major ways that corn can be processed. These processes include wet-milling, dry-milling, and an alkaline-cooked procedure.

FSI Corn Disappearance Rises While Feed Use and Exports Vary



Wet-Milled Process and Products

Wet-millers currently grind about 77 percent of all corn used in the FSI category. There are only about 10 companies in this industry and they are located chiefly in the Midwest.

The wet-milling process starts by soaking the individual corn kernels in a sulfur dioxide solution to separate the various components of each kernel. The main parts of the kernel are an outer covering or hull, the corn germ, the gluten, and starch.

Most of the corn oil is contained in the corn germ. The gluten is the yellowish portion found on either side of the kernel and contains most of the protein. The remaining white powdery part is starch.

About 34 pounds of starch can be obtained from a 56-pound bushel of corn. The starch can be left as such or can be converted into corn syrups or dextrose. The dextrose may be fermented into fuel or beverage alcohol.

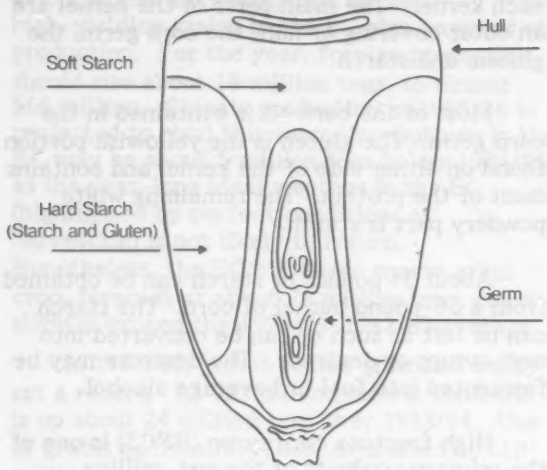
High fructose corn syrup (HFCS) is one of the primary products of the wet-milling industry. HFCS is widely used as a substitute for sugar in soft drinks, but is also used as a sweetener in cereal and bakery products and in processed foods. Glucose syrup is used as a sweetener in confectionery products and processed foods as well as being used by the brewing industry. Dextrose is a popular brewing adjunct in production of light beer and is also used in confectionery, cereal, and bakery products.

There are two major types of HFCS--HFCS 55 and HFCS 42. Each consists of a blend of fructose, glucose, and dextrose.

Corn: Food, seed, and industrial use 1/

Year beginning October 1	Wet-milled products				Dry-milled alcohol	Dry-milled and alkaline-cooked products	Seed	Total
	HFCS	Glucose and dextrose	Starch	Wet-milled alcohol				
	Million bushels							
1971/72	10	125	100	10	15	135	15	410
1972/73	15	145	110	10	18	136	16	450
1973/74	20	155	110	10	20	139	18	472
1974/75	30	160	115	10	17	147	19	498
1975/76	45	165	115	10	15	153	20	523
1976/77	65	165	120	10	15	155	20	550
1977/78	80	170	130	15	15	160	20	590
1978/79	105	170	135	15	20	155	20	620
1979/80	140	175	130	30	20	160	20	675
1980/81	165	185	125	40	35	165	20	735
1981/82	190	185	135	85	35	163	19	812
1982/83	215	185	135	130	50	168	15	898
1983/84	255	190	145	150	50	164	19	973

1/ Data in this table are estimates based on production and sales figures obtained from various government and private industry publications as well as on unpublished information provided by numerous industry sources.



The Corn Kernel

HFCS 55 contains 55 percent fructose and HFCS 42 contains 42. The most commonly used syrup is HFCS 55, which is as sweet as sucrose or sugar. Glucose is not as sweet as HFCS and dextrose is not as sweet as glucose.

Most starch is used in industrial products such as paper and paper products, adhesives, and wallboard. Starch is also used as a binding and lubricating agent, as well as for warp sizing and finishing of textiles. About 10 to 15 percent of starch sold is used as a food product. Numerous processed foods contain a specially modified starch to enhance their quality. For example, starch may be used to thicken, to stabilize, to encapsulate, to coat or glaze, to retain moisture, to form a gel, or to prevent caking.

Byproducts of corn wet-milling are corn oil, corn gluten feed, and corn gluten meal. Corn gluten feed, an animal feed, is usually standardized at 21 percent protein content and is a blend of the hulls, evaporated steepwater, and corn germ meal. Steepwater is the concentrated solubles recovered from the initial soaking stage of the wet-milling process and corn germ meal is the residue remaining from the germ after the oil has been extracted. Corn gluten meal, also an animal feed, is processed from the yellowish gluten portion of the kernel and has a minimum protein content of 60 percent.

A byproduct of wet-milled alcohol production is carbon dioxide, which is used in the flash freezing of meat, the carbonization of beverages, and as a nutrient source in the growing of hydroponic vegetables.

Dry-Milled Process in Alcohol Production

The growing demand for fuel alcohol has spurred the building of several plants strictly for alcohol production. A small amount of corn is also dry-milled to produce beverage alcohol products such as whiskey and bourbon. Currently, all of these plants are grinding about 5 percent of corn in the FSI category.

Corn used in the dry-milled process is pulverized and then cooked to gelatinize the starch. The starch is converted to sugar and then fermented to produce alcohol. A byproduct of this process is distillers dried grains, which are used as a livestock feed.

Dry-Milled and Alkaline-Cooked Process in Food Production

About 16 percent of corn used in all FSI products is dry-milled or cooked for food products. Most dry-milled products are produced by five or six large companies located mainly in the Corn Belt. But there are close to 90 small dry-milled operations located thoughout the central portion of the United States, the South and the mid-Atlantic region. The largest alkaline-cooked facilities are located in Texas and California, with numerous small operations scattered throughout the West.

In the dry-milling process, the germ may or may not be removed for oil extraction. If the oil is extracted, the germ residue is blended with hull factions and corn cleanings to produce hominy feed. The remaining granular material is then pulverized and the pieces sorted by size. The largest sizes are processed as flaking grits, followed in order of size by brewers' grits, fine grits, meal, and flour. Flaking grits are used to make corn flakes and brewers' grits are used as a carbohydrate source in making beer. At least half the corn ground by dry-millers is used to produce these two products. Grits, meal, and flour can be sold as such or used by other industries to make breakfast cereals, snacks, and processed or convenience foods. Breakfast grits and nondegermed corn products are usually processed by the small regional millers.

In the alkaline-cooked process, whole corn is heated in lye or lime water to soften and loosen the hulls. The kernels are then washed thoroughly and ground into a dough or flour called masa. Masa is used to prepare tortillas and tortilla chips. A similar process is used to make corn chips. Whole corn prepared by this method is known as hominy.

Growth in FSI Attributed to HFCS and Fuel Alcohol

Most of the growth in corn use for food and industrial products has occurred in the wet-milling industry in predominantly two categories--HFCS and fuel alcohol. HFCS has grown at a phenomenal rate because it is cheaper to produce and process than U.S. sugar. For this reason, many food and beverage industries have steadily substituted HFCS for sugar in their products. This past year, for example, the Coca-Cola Company and Pepsico, Inc., announced plans to allow up to 100 percent substitution of HFCS for sugar in their soft drinks.

Fuel alcohol use grew as a result of Federal and State subsidies that made it economically feasible for an alcohol-gasoline blend to compete with gasoline. The octane-boosting properties of fuel alcohol also made it attractive for blending into super unleaded grades.

Wet-millers took the lead in building fuel alcohol plants and did so without Government assistance. Since more HFCS is produced in the summer, millers saw alcohol production as a way to even out production schedules and plant use over the year. Gradually, more dry-milled operations have been brought on line as plants received Government backing for loans.

Outlook

Growth in food and industrial corn products is expected to slow during the late 1980's. One reason is because HFCS is near the saturation point in products where it can be used. In addition, pending farm legislation could make sugar more competitive with HFCS. Further growth in fuel alcohol production is uncertain, despite the enormous market potential created by the recent Environmental Protection Agency ruling on reducing lead in gasoline. Fuel alcohol is used as a replacement for lead, but must compete with other octane enhancers. Also, since limited supply has been a major problem in the alcohol market, many of the major oil companies may invest in technological improvements for increasing octane rather than depending on the availability of alcohol. Furthermore, investors are reluctant to back an industry that has not yet proven it can exist without some form of Government assistance.

Fertilizer Use and Weather Effects on Corn and Soybean Yields

Lloyd Teigen
Agricultural Economist
Economic Research Service

ABSTRACT: Yield equations were estimated for corn and soybeans which incorporated information on planted acreage, weather, trend yield effects, and fertilizer application rates derived from the SRS objective yield surveys. The corn and soybean yield forecasts made in July 1984 differed from the August 1984 Crop Production yield estimates by less than 0.6 standard errors of forecast. The odds against such performance occurring by chance are substantial.

KEYWORDS: Crop yields, fertilizer, weather, forecasts.

This article presents estimates of yield response of corn and soybeans to fertilizer use, weather effects, and planted area. The estimation period for the model is 1964-83. Fertilizer data for earlier years are not available, precluding any larger sample. The

weather variables consist of temperature and precipitation for the Corn Belt region, weighting observations for each climatic division by the harvested cropland in its constituent counties. Although it is common to use "dummy variables" to eliminate the effect of outlying observations, this was not done for the estimates in this paper so that the weather variables would reflect the effects of extreme weather.

The fertilizer data consist of the nutrient pounds of nitrogen, phosphates, and potash (N, P_2O_5, K_2O) applied per acre receiving that nutrient, and the percentage of acres planted receiving each nutrient. The SRS objective yield surveys determine the application rates of each nutrient to specific crops for major producing States for that commodity. These data are subsequently reported in the Inputs Outlook and Situation Report as both State and national average estimates by commodity and nutrient. The product of the application rate per receiving acre and the percentage of acres receiving will be called the rate per planted acre.

Three variants of the corn equation and four variants of the soybean equation are presented. Each commodity will be discussed, in turn, including the underlying data and the basis for the forecast made last July. The results of the 1984 forecasts will be summarized, followed by a forecast for 1985.

Corn Yields

The yield equations (table 1) for corn include Corn Belt temperature and precipitation for July (weighted by harvested cropland in the climatic divisions in each State), in addition to fertilizer, acreage, and trend.

When fertilizer application rates are accounted for, the annual yield trend coefficient is insignificant. Nitrogen affects corn yield the least, as measured by the estimated t-statistic. By contrast, Butell and Naive observed a significant response when nitrogen is the only fertilizer ingredient included in the specification. High phosphate use is associated with lower yields. A pound of potash applied to every acre of corn will increase the U.S. average yield more than a bushel. In May 1984, nitrogen and phosphate were 26 cents a pound and potash was 12 cents per pound. Fertilizer use in recent years accounts for 25 or 26 bushels of the yield forecasts in that year.

Table 1.--Corn: Effect of acreage, fertilizer, and weather on U.S. average yields, 1964-83

							Corn Belt Weather				
	Intercept (in 1980)	Trend	Planted acres	Nitrogen	Phosphates (P_2O_5)	Potash (K_2O)	July precip-itation	July tempera-ture	R^2	d.w.	s.e.e.
	Bushels	Bu/yr	Mil. ac.	Pounds per acre of all corn			- z-score -				
Coeff.	55.060	.068	+.284	.207	-1.079	.845	6.032	-4.001	.893	2.39	4.540
t-stat.	1.96	.05	1.69	.52	-1.25	1.25	5.85	-2.91			
Elast.			.240	.250	-.674	.560					
Coeff.	56.403		+.283		-1.208	1.314	6.544	-4.283	.902	2.31	4.346
t-stat.	4.01		1.80		-3.47	5.52	5.85	-3.37			
Elast.			.239		-.755	.871					
Coeff.	75.879	1.510	+.290				6.363	-3.287	.901	2.21	4.361
t-stat.	5.95	6.38	1.83				5.75	-2.79			

The regression coefficients measure the effects of changes in one aggregate on another which one hopes (but can never be assured) has a causal interpretation. Since these relationships were not the result of a well-controlled experiment, the estimated coefficients should not be interpreted too literally. The negative coefficient on phosphate application and the positive coefficient of planted acreage on yields (high acreage increases yields) could be caused by structural change, statistically outlying years, and changing Government programs in the estimation period. The geographic diversity of U.S. agriculture permits change in national aggregates resulting from relocating production from one region to another having both different yield and different input requirements.

The weather effects are measured in z-scores (standard deviations away from the mean) for the regression. The z-score is obtained when the data are transformed by subtracting the mean from the data series and then dividing the result by the standard deviation of the original data. The z-score has mean zero and standard deviation one. The expected weather effect for the z-score would be quantified as zero, "high" temperature or precipitation would be quantified as +1 (one standard deviation above average), and "low" temperature or precipitation would be quantified as -1. The chance of the weather variable being outside the range -1 to +1 standard deviation is about one in three.

One standard deviation (1.16 inches) of precipitation above the mean for July (3.86 inches) will increase average yields 6 to 6.5 bushels. One standard deviation (1.89 degrees) of temperature above the mean (75.2 degrees) will decrease corn yields 3 to 4 bushels.

All three equations forecast an average corn yield of 108 bushels for 1984, based on planted acreage of 79.9 million, application of N, P_2O_5, and K_2O to all corn of 133, 58, and 72 pounds per acre, average precipitation (z = 0) and cool temperature (z = -1). Equation 1.1 forecasts 107.81 bushels with standard error of 6.81 bushels. Equation 1.2 forecasts 107.84 bushels with standard error of 5.30 bushels. Equation 1.3 forecasts 108.38 bushels with standard error 4.87 bushels. The point estimates are the same, but the interval estimates differ among the equations.

Soybean Yields

The estimated yield equations for soybeans (table 2) incorporate the fertilizer application rates derived from the objective yield surveys, planted acreage, trend, and weather in the Corn Belt. The weather data are based on July precipitation and July temperature weighted by harvested cropland in each climatic division within the States.

Nitrogen applications did not significantly affect U.S. average yields, much as one would expect from the ability of soybean root nodules to fix atmospheric nitrogen in the soil. Phosphates applications raised yields--1 pound on every planted acre would increase average yields by 0.6 bushels per acre (worth about $4.50 per acre). Potash applications were associated with lower yields. The negative response is probably because regions requiring potash (predominately in South) may have lower-than-average yields. Greater weight given these regions may reduce U.S. average yields, while raising the yield in that region.

Although the marginal product of fertilization on soybeans is undoubtedly positive, using the coefficients for fertilizer per acre of all soybeans, and reducing the 1983 applications to zero would raise the equation's forecast of national average soybean yields about 5 bushels. A smaller-than-national average proportion of Midwestern soybean acres receives fertilizer and a greater-than-average portion of Southern soybean acres receives fertilizer. The equation is unable to distinguish the effect of increasing fertilizer on soybeans from the effect of moving soybean production from the Midwest to the South, and national average yields fall accordingly.

The trend effect is about one-half a bushel per acre per year ignoring the increasing proportion of acres receiving fertilizer, and about one-third of a bushel per acre when this is accounted for. The application rate per acre planted to soybeans is the product of the application rate per acre receiving the nutrient and the percent of acres receiving the nutrient.

Table 2.--Soybeans: Effects of acreage, fertilizer, and weather on U.S. average yields, 1964-83

	Intercept (in 1980)	Trend	Planted acres	Nitrogen	Phosphates	potash	Corn Belt weather: July precip-itation	Corn Belt weather: July (Prcp * temp)^2	R^2	d.w.	s.e.e.
	Bushels	Bu/yr	Mil. ac.	Pounds per acre of soybeans			z-score	z-score [4]			
				-- Receiving fertilizer --							
Coeff.	39.212	.559	+.135	-.082	.054	-.290	1.109	-.595	.752	3.23	1.295
t-stat.	3.13	1.83	1.51	-.35	.32	-2.35	2.64	-1.96			
Elast.			.259	-.045	.080	-.581					
Coeff.	39.025	.537	.141			-.278	1.142	-.578	.783	3.07	1.211
t-stat.	4.66	2.17	1.70			-2.45	3.15	-2.06			
Elast.			.270			-.557					
				-- Planted to soybeans --							
Coeff.	25.575	.331	.132	.366	.560	-.623	1.053	-.606	.736	3.16	1.336
t-stat.	4.17	1.46	1.31	.31	1.05	1.92	2.52	-1.92			
Elast.			.252	.040	.24	-.37					
Coeff.	25.845	.343	.130		.684	-.647	1.022	-.612	.754	3.19	1.289
t-stat.	4.42	1.59	1.33		2.03	-2.12	2.61	2.02			
Elast.			.249		.29	-.39					

Planted acreage has a small, but positive effect. Part of this is due to the abnormally low acreage (due to PIK) and low yields in 1983, but there may be a geographic explanation as well. The rising commercial value gave farmers more incentive to improve their production techniques, and human capital associated with soybean production rose with the expansion of acreage.

Precipitation by itself will increase yields about a bushel per standard deviation (1.16 inches) above the July mean (3.86 inches). In addition, there is a quadratic interaction term between temperature and precipitation: the z-score for temperature is multiplied by the z-score for precipitation, and the result is squared. In most years, the effect of this interaction variable is small (9 of 20 years had values less than 0.1), but it exceeded unity in years frequently "dummied out"--1974 (3.1), 1979 (2.0), 1980 (1.1), and 1983 (4.6). The mean for this variable is 0.7 but the median is only 0.16. "Hot" would be one or more standard deviations (1.89 degrees) above the mean temperature (75.2 degrees), and "dry" would be one or more standard deviations below average; their product would be less than -1 and its square would be greater than +1.

Assuming 68 million planted acres, nitrogen, phosphates, and potash of 18, 45 and 70 pounds per acre receiving, or 4, 14, and 24 pounds per acre planted to soybeans, slightly dry ($z = -0.5$) and slightly cool ($z = -0.5$) in the Corn Belt, the 1984 forecast U.S. average yield is between 29.5 and 30.7 bushels. The equations (1 and 2) using fertilizer application rates for acres receiving fertilizer each forecast 30.69 bushels with standard error of forecast 1.525 and 1.527 bushels, respectively. The equations (3 and 4) using the rates averaged over all planted acres forecast 29.66 bushels (with standard error 1.724 bushels) and 29.56 bushels (with standard error of 1.599) bushels.

The equations provide a facility for performing scenarios on both weather and fertilizer availability, without the intellectual "nuisance" of dummy variables cluttering up the equation.

Forecast Accuracy

The preceding sections identify the assumptions underlying forecasts of U.S. average yields of corn and soybeans made last July 19 and 31, respectively. The August 10 *Crop Production* report verifies how well the

Table 3.--Yield forecast evaluation.

Yield estimate by commodity/ equation	Crop Production report				Forecast		
	Jan.'85	...	Sept. 12	Aug. 10	Point estimate	Standard error	t-statistic
Corn	106.6	...	106.3	107.9	As of July 19, 1984		
(1)					107.81	6.81	.01
(2)					107.84	5.30	.01
(3)					107.38	4.87	-.10
Soybeans	28.2	...	30.3	30.5	As of July 31, 1984		
(1)					30.69	1.525	-.12
(2)					30.69	1.527	-.12
(3)					29.66	1.724	.49
(4)					29.56	1.599	.59

Forty-five percent of the area of a Normal distribution lies between -0.6 and +0.6. The odds against two independent events with probability .45 both simultaneouly occurring are four to one against, and the odds against seven independent events simultaneously occurring are 267 to one, if only chance determined the outcome.

estimated equations forecast (table 3). In every case the forecasting error was less than one bushel, and the t-statistics for the forecasting errors were much less than one. Obviously, not all outcomes are independent of one another, but the strong forecasting performance lends considerable credibility to the structure underlying the equations.

With the fertilizer and weather variables set at the 1984 actual values, the *ex post* yield forecasts would have been 106.9 bushels for corn (equation 2) and 30.1 bushels for soybeans (equation 2). Actual 1984 weather raised corn yields about 2.5 bushels above the levels which would pertain to "average" (z=zero) weather and about .5 bushels above the levels which would pertain to assumed weather. Soybean yields were 0.6 bushels less than would correspond to zero values for all weather variables, but only 0.2 bushels less than the estimate using the sample average of 0.7 for the interaction term rather than the product of the two z-scores. Were actual weather values to replace the values assumed in July, the corn yield forecast would be 1.8 bushels smaller, and the soybean forecast would be 0.2 bushels larger.

Outlook for 1985

The two factors that determine the early season outlook for yields are planted acreage and fertilizer application rates. As the season progresses, weather information can also be taken into consideration in this model.

The February 1985 *Prospective Plantings* report indicated that planted acres of all corn for 1985 will be 82.0 million, and soybeans will be 64.5 million.

Fertilizer application rates for 1985 are extrapolated from recent historical trends, with adjustments based on changes in the relative prices of the nutrients in relation with crop prices. The reference elasticity of fertilizer demand with respect to relative prices is assumed to be -0.3, although that specific value is not applied across all nutrients and all commodities. Although fertilizer prices declined between March and October of 1984, the October price was somewhat (2-6 percent) higher than a year earlier. Between October 1983 and October 1984, fertilizer price relative to the price of corn was up about 20 percent and, relative to the price of soybeans, was up between 35 and 40 percent.

For corn, it was assumed that 97 percent of the acres would receive 136 pounds of nitrogen per acre, that 86 percent would receive 62 pounds of phosphate per acre and that 81 percent would receive 85 pounds of potash per acre. The point estimates for corn yields from the equations presented above are 106.7, 105.7 and 107.2 bushels per acre,

respectively. The interval estimates of yield will be wider than those last July by a factor representing the full variance of the weather variable at this time (since no information is incorporated in their 1985 values).

Using last year's estimate of the standard error of forecast as a starting point (1985 will differ somewhat from 1984 but be of the same general magnitude), the weather variance inflates the standard error of forecast from 5.30 bushels to 9.45 bushels for equation (2), which excludes the time trend and nitrogen application. The standard error of forecast in equation (1) goes from 6.81 to 9.94 bushels when weather variation is added to the residual variance and the standard error of equation (3) similarly goes from 4.87 to 8.66 bushels. At this time of year, interval-estimates of corn yield, plus or minus one standard deviation, range from 96 to 116 bushels--with about one chance in three that the 1985 yield will fali outside this range.

For soybeans, the assumed (projected) rates of fertilizer application are as follows: The 19 percent of acres receiving nitrogen will get 16 pounds per acre, the 29 percent receiving phospates will get 44 pounds per acre, and the 30 percent receiving potash will get 71 pounds per acre. The "uninformed" weather assumption is to use the sample average of 0.70745 for the nonlinear interaction between temperature and precipitation. The four soybean yield equations, under those assumptions, forecast U.S. average yield at 30.8, 30.6, 30.3, and 30.5 bushels (proceeding from the top of table 2 to the bottom). Adding the variance due to only the linear component of July precipitation to the July variance of forecast increases the standard error to about 1.9 or 2.0 bushels per acre. The odds are about two to one that the 1985 soybean yield will be between 29 and 33 bushels per acre.

Table 4.--1985 Forecast Summary.

Commodity	Equation	Point forecast	Standard error
		Bu/acre	
Corn	(2)	105.7	9.4
Soybeans	(2)	30.6	1.9

The preceding paragraphs presented a number of alternative yield forecasts based on the assumed values of the exogenous variables. To summarize the results (and indicate the preferred equation), the 1985 forecasts are summarized in table 4.

Based on the model and February acreage intentions, early season projections of the 1985 corn crop appear to be about the same as the 1984 crop, while the projection for the 1985 soybean crop appears to be about 1 percent larger. These estimates will change as more precise information becomes available regarding planted acreage, fertilizer, and weather during the growing season.

References

Butell, R. and J. Naive, "Factors Affecting Corn Yields," *Feed Situation*, May 1978, USDA-ESCS.

Weiss, M.D., Whittington, M.W., and L.D. Teigen. *Weather in U.S. Agriculture: Temperature and Precipitation by State and Farm Production Region, 1950- 84*; USDA - ERS Statistical Bulletin, forthcoming.

Table 1.--Feed grains: Marketing year supply, disappearance, area, and prices, 1980-85 1/

Year 2/	Supply				Disappearance							Ending stocks	
					Domestic use								
	Beginning stocks	Production	Imports	Total	Food	Alc. beverages	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 3/	Total
	Million metric tons													
1980/81	52.4	197.9	0.3	250.6	17.1	5.4	1.3	122.9	146.7	69.3	216.0	7.1	27.5	34.6
1981/82	34.6	246.2	0.3	281.1	18.9	5.5	1.4	128.5	154.3	58.6	212.9	8.9	59.3	68.2
1982/83	68.2	250.2	0.3	318.7	20.5	6.0	1.4	139.5	167.4	54.0	221.4	34.2	63.1	97.3
1983/84	97.3	136.4	0.7	234.4	22.9	5.4	1.5	117.4	147.2	55.7	202.9	11.3	20.2	31.5
1984/85 4/	31.5	236.3	0.8	268.6	-- 32.0 --			132.8	164.8	58.3	223.1			45.5
1985/86*	45.5	243.5 (± 22)	0.5	289.5 (± 22)	-- 33.6 -- (± 2)			135.3 (± 9)	168.8 (± 9)	51.8 (± 6)	220.7 (± 14)			68.9 (± 12)

	Area				Yield per harvested hectare	Index	Government-support program
	National program	Set-aside and diverted	Planted	Harvested for grain		Average price received by farmers 5/	Total payments to participants
	Million hectares				Metric tons	1977=100	Million dollars
1980/81	42.7	---	49.1	41.1	4.82	154	6/ 412
1981/82	42.5	---	49.9	43.1	5.71	123	7/ 423
1982/83	---	1.3	49.1	42.9	5.83	136	7/ 419
1983/84	---	15.9	41.6	32.5	4.20	154	8/ 1,103
1984/85 4/	---	2.1	49.3	43.1	5.49		9/ 1,810
1985/86							

1/ Aggregated data on corn, sorghum, barley, and oats. 2/ The marketing year for corn and sorghum begins October 1; for oats and barley, June 1. 3/ Includes total Government loans (original and reseal). 4/ Preliminary. 5/ Excludes support payments. 6/ Disaster payments. 7/ Deficiency and disaster payments. 8/ Deficiency and diversion payments. 9/ Deficiency payments. *The probability is 2 out of 3 that the outcome will be within this range.

Table 2.--Corn: Marketing year supply and disappearance, area, and prices, 1980-85

Year beginning October 1	Supply: Beginning stocks	Supply: Production	Supply: Imports	Supply: Total	Disappearance: Domestic use: Food 1/	Domestic use: Alc. beverages 2/	Domestic use: Seed	Domestic use: Feed and residual	Domestic use: Total	Disappearance: Exports	Disappearance: Total disappearance	Ending stocks Sept. 30: Govt. owned	Ending stocks Sept. 30: Privately owned 3/	Ending stocks Sept. 30: Total
	Million bushels													
1980/81	1,617.1	6,639.4	1.2	8,257.7	641.8	73.3	20.2	4,132.9	4,868.2	2,355.2	7,223.4	237.8	796.5	1,034.3
1981/82	1,034.3	8,118.7	1.2	9,154.2	709.4	82.7	19.4	4,201.8	5,013.3	1,966.9	6,980.2	302.4	1,871.6	2,174.0
1982/83	2,174.0	8,235.1	0.9	10,410.0	774.3	109.0	14.5	4,522.3	5,420.1	1,870.0	7,290.1	1,166.3	1,953.6	3,119.9
1983/84	3,119.9	4,174.7	2.5	7,297.1	868.9	85.0	18.9	3,735.9	4,708.7	1,865.2	6,573.9	334.0	389.2	723.2
1984/85 4/	723.2	7,656.2	2.0	8,381.4	--	1,050.0	--	4,200.4	5,250.4	1,950.0	7,200.4			1,181.0
1985/86*	1,181.0	7,875.0 (± 700)	1.0	9,057.0 (± 700)	--	1,110.0 (± 35)	--	4,300.0 (± 330)	5,410.0 (± 330)	1,700.0 (± 250)	7,110.0 (± 500)			1,947.0 (± 475)

Year beginning October 1	Area: National program	Area: Set-aside and diverted	Area: Planted	Area: Harvested for grain	Yield per harvested acre	Average prices: Received by farmers 5/	Average prices: St. Louis No. 2 Yellow	Average prices: Omaha No. 2 Yellow	Average prices: Gulf Ports No. 2 Yellow	Government-support program: National average loan rate	Government-support program: Target price	Government-support program: Total payments to participants
	Million acres				Bushels	Dollars per bushel						Mil. dol.
1980/81	84.1	---	84.0	73.0	91.0	3.11	3.35	3.13	3.54	2.25	2.35	7/ 280
1981/82	80.5	---	84.1	74.5	108.9	2.50	2.61	2.46	2.83	2.40	2.40	7/ 92
1982/83	---	2.1	81.9	72.7	113.2	2.68	2.98	2.82	3.16	2.55	2.70	8/ 292
1983/84	---	32.2	60.2	51.5	81.1	3.25	3.45	3.20	3.63	2.65	2.86	9/ 904
1984/85 4/	---	4.0	80.4	71.8	106.6	2.65	6/ 2.83	6/ 2.64	6/ 3.04	2.55	3.03	10/ 1,600
1985/86						2.50-2.70						

1/ Includes industrial products. 2/ Malt beverage and distilled liquor products converted to a corn basis. 3/ Includes quantity under loan and farmer-owned reserve. 4/ Preliminary. 5/ Excludes support payments. 6/ October 1984-April 1985. 7/ Disaster payments. 8/ Deficiency and disaster payments. 9/ Diversion payments. 10/ Deficiency payments. *The probability is 2 out of 3 that the outcome will be within this range.

Table 3.--Sorghum: Marketing year supply and disappearance, area, and prices, 1980-85

Year beginning October 1	Supply: Beginning stocks	Supply: Production	Supply: Imports	Supply: Total	Disappearance: Domestic use: Food	Alc. beverages	Seed	Feed and residual	Total	Exports	Total disappearance	Ending stocks Sept. 30: Govt. owned	Privately owned 1/	Total
	Million bushels													
1980/81	146.4	579.3	---	725.7	5.0	4.3	2.0	301.3	312.6	304.6	617.2	38.2	70.3	108.5
1981/82	108.5	875.8	---	984.3	4.3	4.8	2.0	427.7	438.8	249.1	687.9	42.9	253.5	296.4
1982/83	296.4	835.1	---	1,131.5	4.2	3.9	1.8	507.1	517.0	214.3	731.3	175.6	224.6	400.2
1983/84	400.2	487.5	0.1	887.8	4.2	3.7	2.1	380.6	390.6	246.4	637.0	98.8	152.0	250.8
1984/85 2/	250.8	865.9	0.1	1,116.8	--	20.0	--	524.8	544.8	275.0	819.8			297.0
1985/86*	297.0	885.0 (± 90)	---	1,182.0 (± 90)	--	20.0	--	525.0 (± 50)	545.0 (± 55)	275.0 (± 40)	820.0 (± 75)			362.0 (± 70)

Year beginning October 1	Area: National program	Area: Set-aside and diverted	Area: Planted	Area: Harvested for grain	Yield per harvested acre	Average prices: Received by farmers 3/	Kansas City No. 2 Yellow	Texas No. 2 Yellow	Gulf ports No. 2 Yellow	Government-support program: National average loan rate	Target price	Total payments to participants
	Million acres				Bushels	Dollars per cwt.						Mil. dol.
1980/81	12.8	---	15.6	12.5	46.3	5.25	5.36	5.86	6.16	3.82	4.46	5/ 101
1981/82	14.3	---	15.9	13.7	64.0	4.27	4.29	4.85	4.97	4.07	4.55	6/ 268
1982/83	---	0.7	16.0	14.1	59.1	4.50	4.96	5.30	5.55	4.32	4.64	6/ 67
1983/84	---	5.7	11.9	10.0	48.7	5.07	5.13	5.48	5.65	4.50	4.86	7/ 114
1984/85 2/	---	0.6	17.2	15.3	56.4	4.20	4/ 4.43	4/ 4.93	4/ 5.07	4.32	5.14	8/ 160
1985/86						4.11-4.46						

1/ Includes quantity under loan and farmer-owned reserve. 2/ Preliminary. 3/ Excludes support payments. 4/ October 1984-April 1985. 5/ Disaster payments. 6/ Deficiency and disaster payments. 7/ Diversion payments. 8/ Deficiency payments. *The probability is 2 out of 3 that the outcome will be within this range.

Table 4.--Barley: Marketing year supply and disappearance, area, and prices, 1980-85

Year beginning June 1	Supply: Beginning stocks	Supply: Production	Supply: Imports	Supply: Total	Disappearance: Domestic use: Food	Alc. beverages	Seed	Feed and residual	Total	Exports	Total disappearance	Ending stocks May 31: Govt. owned	Privately owned 1/	Total
	Million bushels													
1980/81	192.1	361.1	10.2	563.4	7.0	155.3	13.2	173.9	349.4	76.7	426.1	3.4	133.9	137.3
1981/82	137.3	473.5	9.6	620.4	6.9	151.1	16.3	198.2	372.5	100.1	472.6	3.3	144.5	147.8
1982/83	147.8	515.9	10.7	674.4	7.2	145.5	17.4	240.4	410.5	47.2	457.7	6.0	210.7	216.7
1983/84	216.7	508.9	7.1	732.7	7.0	142.5	19.9	282.4	451.8	91.5	543.3	11.9	177.5	189.4
1984/85 2/	189.4	596.5	10.0	795.9	---	170.0	---	299.9	469.9	80.0	549.9			246.0
1985/86*	246.0	625.0 (± 60)	10.0	881.0 (± 60)	---	170.0 (± 10)	---	300.0 (± 25)	470.0 (± 30)	75.0 (± 15)	545.0 (± 40)			336.0 (± 60)

Year beginning June 1	Area: National program	Area: Set-aside and diverted	Area: Planted	Area: Harvested for grain	Yield per harvested acre	Average prices received by farmers 3/	Minneapolis: No. 2 or better, feed	Minneapolis: No. 3 or better, malting	Portland: No. 2	Government-support program: National average loan rate	Target price	Total payments to participants
	Million acres				Bushels		Dollars per bushel					Mil. dol.
1980/81	8.7	---	8.3	7.3	49.7	2.86	2.60	3.64	3.34	1.83	2.55	5/ 31
1981/82	10.2	---	9.6	9.0	52.4	2.45	2.21	3.06	2.87	1.95	2.60	6/ 63
1982/83	---	0.4	9.5	9.0	57.2	2.22	1.76	2.53	2.52	2.08	2.60	7/ 60
1983/84	---	1.1	10.4	9.7	52.3	2.50	2.48	2.84	2.91	2.16	2.60	8/ 72
1984/85 2/	---	0.5	11.9	11.2	53.4	2.30	4/ 2.09	4/ 2.55	4/ 2.61	2.08	2.60	7/ 50
1985/86						2.10-2.30						

1/ Includes quantity under loan and farmer-owned reserve. 2/ Preliminary. 3/ Excludes support payments. 4/ June 1984-April 1985. average. 5/ Disaster payments. 6/ Deficiency and disaster payments. 7/ Deficiency payments. 8/ Deficiency and diversion payments.
*The probability is 2 out of 3 that the outcome will be within this range.

Table 5.--Oats: Marketing year supply and disappearance, area, and prices, 1980-85

Year beginning June 1	Supply: Beginning stocks	Supply: Production	Supply: Imports	Supply: Total	Disappearance: Domestic use: Food	Alc. beverages	Seed	Feed and residual	Total	Exports	Total disappearance	Ending stocks May 31: Govt. owned	Privately owned 1/	Total
	Million bushels													
1980/81	236.4	458.8	1.3	696.5	41.0	---	33.0	432.2	506.2	13.3	519.5	2.3	174.7	177.0
1981/82	177.0	509.5	1.6	688.1	41.2	---	35.4	453.0	529.6	6.6	536.2	0.7	151.2	151.9
1982/83	151.9	592.6	3.9	748.4	41.7	---	43.3	440.6	525.6	3.0	528.6	0.7	219.1	219.8
1983/84	219.8	477.0	30.1	726.9	40.9	---	36.6	466.1	543.6	2.2	545.8	1.5	179.6	181.1
1984/85 2/	181.1	471.9	35.0	688.0	--	80.0	--	430.0	510.0	1.0	511.0			177.0
1985/86*	177.0	510.0 (± 50)	20.0	707.0 (± 50)	--	80.0 (± 5)	--	425.0 (± 40)	505.0 (± 45)	2.0	507.0 (± 45)			200.0 (± 30)

Year beginning June 1	Area: National program	Area: Set-aside and diverted 3/	Area: Planted	Area: Harvested for grain	Yield per harvested acre	Average prices: Received by farmers 4/	Minneapolis: No. 2 white, heavy	Portland: No. 2 white, heavy	Toledo: No. 2	Government-support program: National average loan rate	Target price	Total payments to participants
	Million acres				Bushels	Dollars per bushel						Mil. dol.
1980/81	---	---	13.4	8.7	53.0	1.79	2.04	2.42	2.17	1.16	---	---
1981/82	---	---	13.6	9.4	54.2	1.89	2.14	2.36	2.23	1.24	---	---
1982/83	---	0.1	14.0	10.3	57.8	1.49	1.69	2.18	1.55	1.31	1.50	---
1983/84	---	0.3	20.3	9.1	52.6	1.67	1.87	1.95	2.01	1.36	1.60	6/ 13
1984/85 2/	---	0.1	12.4	8.1	58.1	1.70	5/ 1.83	5/ 2.12	5/ 1.95	1.31	1.60	---
1985/86						1.45-1.65						

1/ Includes quantity under loan and farmer-owned reserve. 2/ Preliminary. 3/ Not included in the program until 1982. 4/ Excludes support payments. 5/ June 1984-April 1985 average. 6/ Deficiency and diversion payments. *The probability is 2 out of 3 that the outcome will be within this range.

Table 6.--Feed grains: Feed year supply and disappearance, specified periods, 1980-85
(corn, sorghum, oats, barley)

Year and periods beginning October 1	Supply				Disappearance							Ending stocks		
					Domestic use					Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
	Beginning stocks	Production	Imports	Total	Food	Alc. beverages	Seed	Feed and residual	Total					
	Million metric tons													
1980/81														
Oct.-Dec.	60.4	183.4	0.1	243.9	3.7	1.2	0.1	45.3	50.3	20.7	71.1	7.7	165.1	172.9
Jan.-Mar.	172.9	---	0.1	173.0	3.2	1.3	0.3	32.1	36.9	18.7	55.6	7.6	109.8	117.4
Apr.-May	117.4	---	2/	117.4	2.8	1.0	0.8	20.8	25.4	11.3	36.7	7.6	73.1	80.7
June-Sept.	80.7	17.7	0.1	98.5	7.5	1.9	0.2	24.7	34.3	18.8	53.1	7.1	38.3	45.4
Mkt. year	60.4	201.1	0.3	261.8	17.2	5.4	1.4	122.9	146.9	69.5	216.4	7.1	38.3	45.4
1981/82														
Oct.-Dec.	45.4	228.5	0.1	274.0	4.1	1.2	0.1	46.3	51.7	16.6	68.3	7.4	198.3	205.7
Jan.-Mar.	205.7	---	0.1	205.8	3.5	1.4	0.3	36.3	41.5	14.8	56.3	7.7	141.8	149.5
Apr.-May	149.5	---	0.1	149.6	3.1	1.0	0.9	19.8	24.8	11.2	36.0	7.9	105.7	113.6
June-Sept.	113.6	19.8	0.1	133.5	8.2	1.9	0.2	25.7	36.0	15.8	51.8	8.9	72.8	81.7
Mkt. year	45.4	248.3	0.4	294.1	18.9	5.5	1.5	128.1	154.0	58.4	212.4	8.9	72.8	81.7
1982/83														
Oct.-Dec	81.7	230.4	0.1	312.2	4.7	1.4	0.1	46.5	52.7	14.9	67.6	12.2	232.4	244.6
Jan.-Mar.	244.6	---	0.1	244.7	3.8	1.5	0.2	40.2	45.7	14.8	60.5	13.6	170.6	184.2
Apr.-May	184.2	---	0.1	184.3	3.3	1.0	0.9	24.4	29.6	8.3	37.9	14.0	132.4	146.4
June-Sept.	146.4	18.0	0.3	164.7	8.8	2.1	0.2	29.5	40.6	16.1	56.7	34.3	73.7	108.0
Mkt. year	81.7	248.4	0.6	330.7	20.6	6.0	1.4	140.6	168.6	54.1	222.7	34.3	73.7	108.0
1983/84														
Oct.-Dec.	108.0	118.4	0.1	226.5	5.3	1.2	0.1	49.3	55.9	15.7	71.6	36.3	118.6	154.9
Jan.-Mar.	154.9	---	0.2	155.1	4.3	1.4	0.2	29.4	35.3	15.5	50.8	35.2	69.1	104.3
Apr.-May	104.3	---	0.1	104.4	4.0	1.0	1.1	18.1	24.2	9.6	33.8	24.6	46.0	70.6
June-Sept.	70.6	19.8	0.2	90.6	9.3	1.8	0.1	20.3	31.5	15.0	46.5	11.3	32.8	44.1
Mkt. year	108.0	138.2	0.6	246.8	22.9	5.4	1.5	117.1	146.9	55.8	202.7	11.3	32.8	44.1
1984/85														
Oct.-Dec.	44.1	216.5	0.2	260.8	5.6	1.4	0.1	53.5	60.6	18.3	78.9	10.5	171.4	181.9
Jan.-Mar.3/	181.9	---	0.2	182.1	- 6.1 -		0.2	35.6	41.9	16.7	58.6	10.2	113.3	123.5
Apr.-May														
June-Sept.														
Mkt. year														

1/ Includes quantity under loan and farmer-owned reserve. 2/ Less than 50,000 metric tons. 3/ Beginning 1985 food and alcohol combined.

Table 7.--Corn: Marketing year supply and disappearance, specified periods, 1980-85

Year and periods beginning October 1	Supply				Disappearance						Ending stocks		
					Domestic use								
	Beginning stocks	Production	Imports	Total	Food 1/	Alc. beverages 2/	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 3/	Total
	Million bushels													
1980/81														
Oct.-Dec.	1,617.1	6,639.4	0.2	8,256.7	136.3	16.6	---	1,519.3	1,672.2	727.8	2,400.0	254.3	5,602.4	5,856.7
Jan.-Mar.	5,856.7	---	0.3	5,857.0	116.3	18.3	4.0	1,099.4	1,238.0	632.9	1,870.9	250.0	3,736.1	3,986.1
Apr.-May	3,986.1	---	0.1	3,986.2	106.7	13.8	12.2	684.3	817.0	395.7	1,212.7	251.6	2,521.9	2,773.5
June-Sept.	2,773.5	---	0.6	2,774.1	282.5	24.6	4.0	829.9	1,141.0	598.8	1,739.8	237.8	796.5	1,034.3
Mkt. year	1,617.1	6,639.4	1.2	8,257.7	641.8	73.3	20.2	4,132.9	4,868.2	2,355.2	7,223.4	237.8	796.5	1,034.3
1981/82														
Oct.-Dec.	1,034.3	8,118.7	0.4	9,153.4	153.2	16.8	---	1,517.2	1,687.2	545.5	2,232.7	247.6	6,673.1	6,920.7
Jan.-Mar.	6,920.7	---	0.3	6,921.0	128.4	20.2	3.9	1,180.9	1,333.4	489.4	1,822.8	261.7	4,836.5	5,098.2
Apr.-May	5,098.2	---	0.1	5,098.3	119.4	15.2	12.1	662.5	809.2	409.0	1,218.2	269.7	3,610.4	3,880.1
June-Sept.	3,880.1	---	0.4	3,880.5	308.4	30.5	3.4	841.2	1,183.5	523.0	1,706.5	302.4	1,871.6	2,174.0
Mkt. year	1,034.3	8,118.7	1.2	9,154.2	709.4	82.7	19.4	4,201.8	5,013.3	1,966.9	6,980.2	302.4	1,871.6	2,174.0
1982/83														
Oct.-Dec.	2,174.0	8,235.1	0.3	10,409.4	175.2	27.9	---	1,488.9	1,692.0	512.7	2,204.7	429.0	7,775.7	8,204.7
Jan.-Mar.	8,204.7	---	0.2	8,204.9	140.0	28.0	1.3	1,329.7	1,499.0	507.9	2,006.9	483.4	5,714.6	6,198.0
Apr.-May	6,198.0	---	0.1	6,198.1	125.0	17.6	10.3	812.8	965.7	308.5	1,274.2	491.7	4,432.2	4,923.9
June-Sept.	4,923.9	---	0.3	4,924.2	334.1	35.5	2.9	890.9	1,263.4	540.9	1,804.3	1,166.3	1,953.6	3,119.9
Mkt. year	2,174.0	8,235.1	0.9	10,410.0	774.3	109.0	14.5	4,522.3	5,420.1	1,870.0	7,290.1	1,166.3	1,953.6	3,119.9
1983/84														
Oct.-Dec.	3,119.9	4,174.7	0.3	7,294.9	200.3	19.3	---	1,633.5	1,853.1	528.9	2,382.0	1,229.7	3,683.2	4,912.9
Jan.-Mar.	4,912.9	---	0.8	4,913.7	160.0	22.4	1.1	969.1	1,152.6	509.9	1,662.5	1,198.2	2,053.0	3,251.2
Apr.-May	3,251.2	---	0.7	3,251.9	155.0	16.7	15.5	579.9	767.1	339.7	1,106.8	818.6	1,326.5	2,145.1
June-Sept.	2,145.1	---	0.7	2,145.8	353.6	26.6	2.3	553.4	935.9	486.7	1,422.6	334.0	389.2	723.2
Mkt. year	3,119.9	4,174.7	2.5	7,297.1	868.9	85.0	18.9	3,735.9	4,708.7	1,865.2	6,573.9	334.0	389.2	723.2
1984/85														
Oct.-Dec.	723.2	7,656.2	0.9	8,380.3	211.0	24.2	---	1,680.3	1,915.5	608.5	2,524.0	295.5	5,560.8	5,856.3
Jan.-Mar.4/	5,856.3	---	0.3	5,856.6	- 196.0 -		0.6	1,151.4	1,348.0	548.1	1,896.1	255.9	3,704.6	3,960.5
Apr.-May														
June-Sept.														
Mkt. year														

1/ Includes industrial products. 2/ Malt beverage and distilled liquor grain products converted to a corn basis. 3/ Includes quantity under loan and farmer-owned reserve. 4/ Beginning 1985 food and alcohol combined.

Table 8.--Sorghum: Marketing year supply and disappearance, specified periods, 1980-85

Year and periods beginning October 1	Supply				Disappearance							Ending stocks		
					Domestic use					Exports	Total disappearance		Privately:	
	Beginning stocks	Production	Imports	Total	Food	Alc. beverages	Seed	Feed and residual	Total			Govt. owned	owned 1/	Total
	Million bushels													
1980/81														
Oct.-Dec.	146.4	579.3	2/	725.7	1.6	1.2	---	192.1	194.9	66.2	261.1	43.7	420.9	464.6
Jan.-Mar.	464.6	---	2/	464.6	1.6	0.9	0.2	63.9	66.6	84.1	150.7	43.5	270.4	313.9
Apr.-May	313.9	---	2/	313.9	0.8	0.7	1.2	85.0	87.7	41.7	129.4	43.8	140.7	184.5
June-Sept.	184.5	---	2/	184.5	1.0	1.5	0.6	-39.7	-36.6	112.6	76.0	38.2	70.3	108.5
Mkt. year	146.4	579.3	2/	725.7	5.0	4.3	2.0	301.3	312.6	304.6	617.2	38.2	70.3	108.5
1981/82														
Oct.-Dec.	108.5	875.8	2/	984.3	1.3	1.3	---	215.9	218.5	77.8	296.3	38.4	649.6	688.0
Jan.-Mar.	688.0	---	2/	688.0	1.3	1.3	0.2	149.4	152.2	74.3	226.5	38.2	423.3	461.5
Apr.-May	461.5	---	2/	461.5	0.5	0.8	1.2	57.7	60.2	21.8	82.0	38.3	341.2	379.5
June-Sept.	379.5	---	2/	379.5	1.2	1.4	0.6	4.7	7.9	75.2	83.1	42.9	253.5	296.4
Mkt. year	108.5	875.8	2/	984.3	4.3	4.8	2.0	427.7	438.8	249.1	687.9	42.9	253.5	296.4
1982/83														
Oct.-Dec	296.4	835.1	2/	1,131.5	1.4	1.0	---	251.6	254.0	67.0	321.0	46.7	763.8	810.5
Jan.-Mar.	810.5	---	2/	810.5	1.2	1.0	0.1	124.5	126.8	62.5	189.3	47.8	573.4	621.2
Apr.-May	621.2	---	---	621.2	0.4	0.6	0.8	76.2	78.0	14.1	92.1	54.0	475.1	529.1
June-Sept.	529.1	---	2/	529.1	1.2	1.3	0.9	54.8	58.2	70.7	128.9	175.6	224.6	400.2
Mkt. year	296.4	835.1	2/	1,131.5	4.2	3.9	1.8	507.1	517.0	214.3	731.3	175.6	224.6	400.2
1983/84														
Oct.-Dec.	400.2	487.5	---	887.7	1.3	1.1	---	168.4	170.8	62.1	232.9	189.3	465.5	654.8
Jan.-Mar.	654.8	---	---	654.8	1.3	0.7	0.2	105.2	107.4	77.8	185.2	175.3	294.3	469.6
Apr.-May	469.6	---	---	469.6	0.3	0.6	0.8	69.5	71.2	29.5	100.7	137.4	231.5	368.9
June-Sept.	368.9	---	0.1	369.0	1.3	1.3	1.1	37.5	41.2	77.0	118.2	98.8	152.0	250.8
Mkt. year	400.2	487.5	0.1	887.8	4.2	3.7	2.1	380.6	390.6	246.4	637.0	98.8	152.0	250.8
1984/85														
Oct.-Dec.	250.8	865.9	0.1	1,116.8	1.4	4.0	---	301.9	307.3	84.6	391.9	105.7	619.2	724.9
Jan.-Mar.3/	724.9	---	---	724.9	- 3.8 -		0.2	140.3	144.3	99.9	244.2	134.5	346.2	480.7
Apr.-May														
June-Sept.														
Mkt. year														

1/ Includes quantity under loan and farmer-owned reserve. 2/ Less than 50,000 bushels. 3/ Beginning 1985 food and alcohol combined.

Table 9.--Barley: Marketing year supply and disappearance, specified periods, 1980-85

Year and periods beginning June 1	Supply				Disappearance							Ending stocks		
					Domestic use									
	Beginning stocks	Production	Imports	Total	Food	Alc. beverages	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
	Million bushels													
1980/81														
June-Sept.	192.1	361.1	3.5	556.7	2.5	56.6	1.2	78.8	139.1	24.9	164.0	3.5	389.2	392.7
Oct.-Dec.	392.7	---	2.3	395.0	1.7	33.9	2.2	32.2	70.0	21.4	91.4	3.5	300.1	303.6
Jan.-Mar.	303.6	---	2.7	306.3	1.7	36.0	3.7	38.7	80.1	22.7	102.8	3.4	200.1	203.5
Apr.-May	203.5	---	1.7	205.2	1.1	28.8	6.1	24.2	60.2	7.7	67.9	3.4	133.9	137.3
Mkt. year	192.1	361.1	10.2	563.4	7.0	155.3	13.2	173.9	349.4	76.7	426.1	3.4	133.9	137.3
1981/82														
June-Sept.	137.3	473.5	2.4	613.2	2.5	54.7	1.3	75.4	133.9	32.6	166.5	3.3	443.4	446.7
Oct.-Dec.	446.7	---	2.4	449.1	1.7	32.1	2.3	50.7	86.8	33.0	119.8	3.3	326.0	329.3
Jan.-Mar.	329.3	---	2.7	332.0	1.7	37.2	4.0	41.7	84.6	23.1	107.7	3.3	221.0	224.3
Apr.-May	224.3	---	2.1	226.4	1.0	27.1	8.7	30.4	67.2	11.4	78.6	3.3	144.5	147.8
Mkt. year	137.3	473.5	9.6	620.4	6.9	151.1	16.3	198.2	372.5	100.1	472.6	3.3	144.5	147.8
1982/83														
June-Sept.	147.8	515.9	5.1	668.8	2.5	51.3	1.3	92.2	147.3	25.4	172.7	3.9	492.2	496.1
Oct.-Dec.	496.1	---	1.9	498.0	1.8	32.1	2.8	40.7	77.4	6.5	83.9	4.8	409.3	414.1
Jan.-Mar.	414.1	---	2.2	416.3	1.8	35.5	3.9	68.5	109.7	12.7	122.4	5.8	288.1	293.9
Apr.-May	293.9	---	1.5	295.4	1.1	26.6	9.4	39.0	76.1	2.6	78.7	6.0	210.7	216.7
Mkt. year	147.8	515.9	10.7	674.4	7.2	145.5	17.4	240.4	410.5	47.2	457.7	6.0	210.7	216.7
1983/84														
June-Sept.	216.7	508.9	3.4	729.0	2.5	50.9	1.2	135.5	190.1	23.4	213.5	9.3	506.2	515.5
Oct.-Dec.	515.5	---	1.5	517.0	1.7	30.0	2.4	82.4	116.5	32.9	149.4	11.4	356.2	367.6
Jan.-Mar.	367.6	---	1.2	368.8	1.7	35.2	3.9	34.0	74.8	25.1	99.9	12.0	256.9	268.9
Apr.-May	268.9	---	1.0	269.9	1.1	26.4	12.4	30.5	70.4	10.1	80.5	11.9	177.5	189.4
Mkt. year	216.7	508.9	7.1	732.7	7.0	142.5	19.9	282.4	451.8	91.5	543.3	11.9	177.5	189.4
1984/85														
June-Sept.	189.4	596.5	3.6	789.5	2.5	50.4	1.2	132.1	186.2	29.7	215.9	12.2	561.4	573.6
Oct.-Dec.	573.6	---	3.0	576.6	1.7	30.5	2.4	75.1	109.7	30.7	140.4	13.0	423.2	436.2
Jan.-Mar.2/	436.2	---	2.2	438.4	- 36.7 -		4.0	65.3	106.0	13.1	119.1	14.2	305.1	319.3
Apr.-May														
Mkt. year														

1/ Includes quantity under loan and farmer-owned reserve. 2/ Beginning 1985 food and alcohol combined.

Table 10.--Oats: Marketing year supply and disappearance, specified periods, 1980-85

Year and periods beginning June 1	Supply				Disappearance							Ending stocks		
					Domestic use								Privately:	
	Beginning stocks	Production	Imports	Total	Food	Alc. beverages	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	owned 1/	Total
					Million bushels									
1980/81														
June-Sept.	236.4	458.8	0.6	695.8	15.0	---	1.8	190.4	207.2	3.9	211.1	2.7	482.0	484.7
Oct.-Dec.	484.7	---	0.2	484.9	10.0	---	1.8	79.2	91.0	2.8	93.8	2.7	388.4	391.1
Jan.-Mar.	391.1	---	0.3	391.4	10.0	---	7.0	115.6	132.6	2.6	135.2	2.5	253.7	256.2
Apr.-May	256.2	---	0.2	256.4	6.0	---	22.4	47.0	75.4	4.0	79.4	2.3	174.7	177.0
Mkt. year	236.4	458.8	1.3	696.5	41.0	---	33.0	432.2	506.2	13.3	519.5	2.3	174.7	177.0
1981/82														
June-Sept.	177.0	509.5	0.3	686.8	16.0	---	2.0	207.2	225.2	3.2	228.4	1.7	456.7	458.4
Oct.-Dec.	458.4	---	0.2	458.6	10.0	---	2.0	80.2	92.2	1.2	93.4	1.7	363.5	365.2
Jan.-Mar.	365.2	---	0.2	365.4	10.0	---	7.3	111.4	128.7	1.2	129.9	1.7	233.8	235.5
Apr.-May	235.5	---	0.9	236.4	5.2	---	24.1	54.2	83.5	1.0	84.5	0.7	151.2	151.9
Mkt. year	177.0	509.5	1.6	688.1	41.2	---	35.4	453.0	529.6	6.6	536.2	0.7	151.2	151.9
1982/83														
June-Sept.	151.9	592.6	0.8	745.3	16.2	---	2.0	167.7	185.9	1.3	187.2	0.6	557.5	558.1
Oct.-Dec.	558.1	---	0.2	558.3	10.0	---	2.0	92.0	104.0	1.0	105.0	0.7	452.6	453.3
Jan.-Mar.	453.3	---	1.6	454.9	10.7	---	7.6	117.3	135.6	0.3	135.9	0.7	318.3	319.0
Apr.-May	319.0	---	1.3	320.3	4.8	---	31.7	63.6	100.1	0.4	100.5	0.7	219.1	219.8
Mkt. year	151.9	592.6	3.9	748.4	41.7	---	43.3	440.6	525.6	3.0	528.6	0.7	219.1	219.8
1983/84														
June-Sept.	219.8	477.0	11.7	708.5	15.8	---	1.9	184.8	202.5	0.8	203.3	1.1	504.1	505.2
Oct.-Dec.	505.2	---	4.9	510.1	9.9	---	1.9	118.8	130.6	0.7	131.3	1.4	377.4	378.8
Jan.-Mar.	378.8	---	10.6	389.4	10.5	---	7.4	101.2	119.1	0.3	119.4	1.5	268.5	270.0
Apr.-May	270.0	---	2.9	272.9	4.7	---	25.4	61.3	91.4	0.4	91.8	1.5	179.6	181.1
Mkt. year	219.8	477.0	30.1	726.9	40.9	---	36.6	466.1	543.6	2.2	545.8	1.5	179.6	181.1
1984/85														
June-Sept.	181.1	471.9	5.8	658.8	15.7	---	1.9	166.7	184.3	0.6	184.9	1.5	472.4	473.9
Oct.-Dec.	473.9	---	9.1	483.0	10.0	---	2.0	113.5	125.5	0.3	125.8	1.6	355.6	357.2
Jan.-Mar.	357.2	---	8.3	365.5	10.4	---	7.6	91.2	109.2	0.2	109.4	1.5	254.4	255.9
Apr.-May														
Mkt. year														

1/ Includes quantity under loan and farmer-owned reserve.

Table 11.--Average prices received by farmers, United States, by months, 1979-85

Item and year beginning October 1	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Average weighted by sales 1/
Corn						Dollars per bushel							
1979	2.41	2.27	2.38	2.45	2.39	2.40	2.36	2.42	2.49	2.73	2.92	3.01	2.52
1980	2.99	3.10	3.19	3.19	3.22	3.25	3.24	3.24	3.17	3.14	2.87	2.55	3.11
1981	2.45	2.34	2.39	2.54	2.44	2.46	2.55	2.60	2.57	2.50	2.30	2.15	2.50
1982	1.98	2.13	2.26	2.36	2.56	2.71	2.95	3.03	3.04	3.13	3.35	3.32	2.68
1983	3.15	3.17	3.15	3.15	3.11	3.21	3.32	3.34	3.36	3.30	3.13	2.90	3.25
1984	2.65	2.55	2.56	2.64	2.62	2.66	*2.68						
Sorghum						Dollars per cwt							
1979	3.90	3.99	3.90	4.05	3.98	4.05	3.96	4.04	4.49	4.95	5.12	5.12	4.18
1980	5.36	5.48	5.49	5.48	5.33	5.17	5.25	5.16	5.03	4.84	4.55	4.07	5.25
1981	3.90	3.87	3.95	4.09	4.08	4.00	4.10	4.35	4.17	3.96	3.95	3.80	4.27
1982	3.70	3.78	3.97	4.09	4.42	4.67	4.92	5.05	5.05	5.03	5.29	5.26	4.50
1983	5.01	4.98	4.93	4.92	4.74	4.85	5.00	5.08	4.94	4.64	4.59	4.24	5.07
1984	4.05	4.04	4.15	4.16	4.10	4.23	*4.36						

Item and year beginning June 1	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Average weighted by sales 1/
Oats							Dollars per bushel						
1979	1.35	1.33	1.24	1.29	1.31	1.41	1.31	1.39	1.37	1.34	1.38	1.43	1.36
1980	1.48	1.50	1.53	1.63	1.65	1.84	1.92	1.98	2.01	2.08	2.05	2.05	1.79
1981	1.99	1.84	1.72	1.74	1.78	1.88	1.94	1.97	1.99	2.02	1.99	1.99	1.89
1982	1.88	1.57	1.39	1.35	1.32	1.40	1.44	1.46	1.48	1.49	1.54	1.54	1.49
1983	1.51	1.46	1.45	1.55	1.62	1.67	1.73	1.81	1.88	1.82	1.82	1.84	1.67
1984	1.80	1.71	1.67	1.67	1.74	1.68	1.72	1.74	1.70	1.69	*1.63		
Barley													
1979	2.30	2.22	2.23	2.33	2.32	2.40	2.32	2.27	2.23	2.18	2.15	2.21	2.29
1980	2.36	2.52	2.59	2.65	2.81	2.90	2.97	3.09	3.05	3.04	3.04	3.00	2.86
1981	2.94	2.41	2.37	2.44	2.38	2.49	2.48	2.50	2.40	2.40	2.42	2.53	2.45
1982	2.39	2.16	2.20	2.17	1.98	2.06	2.19	2.16	2.00	2.09	2.22	2.36	2.22
1983	2.32	2.20	2.34	2.46	2.53	2.55	2.55	2.55	2.47	2.50	2.54	2.78	2.50
1984	2.61	2.54	2.26	2.25	2.29	2.25	2.20	2.24	2.20	2.17	*2.18		

Item and year beginning May 1	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Average weighted by sales
Hay (mid-month)							Dollars per ton						
1979	65.60	58.00	56.00	57.50	59.00	60.80	58.90	60.10	59.10	60.00	57.40	60.10	59.50
1980	69.30	65.10	67.00	67.20	71.90	77.20	75.00	74.80	72.80	72.50	69.80	68.20	71.00
1981	75.30	66.90	64.00	63.90	62.70	64.80	65.40	65.70	67.90	69.90	69.50	73.30	67.10
1982	77.50	69.60	66.10	65.00	66.80	67.10	68.70	68.60	70.30	73.20	69.90	74.00	69.30
1983	78.10	72.70	71.20	71.20	74.70	76.80	75.10	76.70	76.60	78.70	79.40	79.80	75.80
1984	85.00	78.00	72.60	71.70	71.70	71.90	72.30	75.30	74.00	75.40	72.50	73.40	73.80

1/ Includes an allowance for unredeemed loans and purchase agreement deliveries valued at the average loan rate, by States; excludes Government payments. *Preliminary.
Source: Agricultural Prices, Crop Reporting Board, USDA.

Table 12.--Cash prices at principal markets, 1979-85

Item and year beginning October 1	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Simple average
						Dollars per bushel							
CORN No. 2 Yellow, St. Louis													
1979	2.59	2.51	2.66	2.50	2.64	2.54	2.53	2.60	2.66	3.01	3.31	3.26	2.73
1980	3.35	3.53	3.59	3.60	3.47	3.42	3.49	3.42	3.33	3.34	3.03	2.61	3.35
1981	2.53	2.59	2.54	2.65	2.61	2.66	2.78	2.78	2.75	2.68	2.42	2.32	2.61
1982	2.12	2.43	2.49	2.52	2.79	2.99	3.24	3.24	3.27	3.39	3.68	3.60	2.98
1983	3.50	3.53	3.45	3.41	3.31	3.55	3.61	3.58	3.57	3.43	3.33	3.09	3.45
1984	2.84	2.77	2.75	2.86	2.84	2.86	2.88						
CORN No. 2 Yellow, Omaha													
1979	2.37	2.32	2.36	2.26	2.33	2.23	2.32	2.43	2.50	2.81	2.98	3.01	2.49
1980	3.16	3.34	3.30	3.29	3.18	3.17	3.24	3.24	3.19	3.15	2.79	2.51	3.13
1981	2.44	2.39	2.37	2.47	2.45	2.48	2.61	2.65	2.65	2.54	2.23	2.23	2.46
1982	2.12	2.35	2.37	2.42	2.62	2.82	3.09	3.10	3.11	3.18	3.39	3.32	2.82
1983	3.23	3.24	3.17	3.11	3.03	3.25	3.33	3.35	3.37	3.22	3.11	2.94	3.20
1984	2.71	2.61	2.55	2.60	2.61	2.68	2.73						
SORGHUM No. 2 Yellow, Kansas City						Dollars per cwt							
1979	4.42	4.41	4.57	4.21	4.35	4.20	4.15	4.31	4.49	5.36	5.71	5.61	4.65
1980	5.65	5.91	5.82	5.79	5.52	5.46	5.49	5.38	5.23	5.29	4.58	4.16	5.36
1981	4.14	4.14	4.27	4.44	4.26	4.28	4.45	4.48	4.50	4.38	4.02	4.06	4.29
1982	3.85	4.25	4.37	4.54	4.87	5.08	5.30	5.37	5.37	5.32	5.69	5.55	4.96
1983	5.37	5.25	5.16	5.09	5.03	5.40	5.36	5.39	5.40	4.95	4.74	4.46	5.13
1984	4.25	4.28	4.32	4.48	4.33	4.58	4.76						

Item and year beginning June 1	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Simple average
						Dollars per bushel							
OATS No. 2 Heavy, Minneapolis													
1979	1.68	1.60	1.47	1.55	1.65	1.67	1.59	1.52	1.50	1.48	1.52	1.62	1.57
1980	1.67	1.80	1.70	1.86	1.96	2.15	2.16	2.20	2.25	2.23	2.21	2.23	2.04
1981	2.18	2.02	1.99	2.02	2.09	2.28	2.10	2.23	2.26	2.16	2.21	2.16	2.14
1982	2.12	1.87	1.53	1.51	1.51	1.67	1.67	1.67	1.63	1.63	1.73	1.71	1.69
1983	1.67	1.60	1.79	1.94	2.00	1.97	1.94	1.98	1.82	1.87	1.89	1.96	1.87
1984	1.92	1.84	1.77	1.79	1.84	1.92	1.87	1.81	1.82	1.79	1.73		
BARLEY No. 2 or Better Feed, Minneapolis													
1979	2.16	2.39	2.15	2.22	2.34	2.11	2.15	2.09	2.04	2.06	2.12	2.09	2.16
1980	2.15	2.48	2.39	2.43	2.77	3.03	2.75	2.81	2.90	2.63	2.51	2.39	2.60
1981	2.09	2.26	2.35	2.21	2.26	2.31	2.06	2.20	2.27	2.16	2.16	2.24	2.21
1982	2.12	1.85	1.72	1.69	1.54	1.58	1.59	1.63	1.72	1.73	2.01	1.95	1.76
1983	1.96	1.95	2.42	2.61	2.60	2.53	2.39	2.55	2.56	2.65	2.74	2.77	2.48
1984	2.59	2.18	2.13	2.05	2.10	2.06	1.88	1.98	1.99	1.97	2.05		
BARLEY No. 3 or Better Malting, 65% or Better Plump, Minneapolis													
1979	2.80	2.82	2.67	3.10	3.18	3.06	2.93	2.87	2.81	2.69	2.73	2.82	2.87
1980	2.99	3.36	3.27	3.63	3.80	3.88	3.77	3.75	3.83	3.71	3.84	3.80	3.64
1981	3.34	2.95	3.15	3.05	3.02	3.07	2.92	3.00	3.14	2.99	2.98	3.05	3.06
1982	2.93	2.63	2.48	2.37	2.42	2.45	2.37	2.38	2.42	2.45	2.68	2.76	2.53
1983	2.60	2.54	2.76	2.90	2.96	2.95	2.77	2.85	2.76	2.91	3.04	3.06	2.84
1984	3.04	2.86	2.48	2.44	2.43	2.45	2.36	2.46	2.47	2.51	2.52		

Source: Grain and Feed Market News, AMS, USDA.

Table 13.--Feed-price ratios for livestock, poultry, and milk, by months, 1979-85

Item and year beginning October 1	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Average
HOG/CORN, U.S. basis 1/													
1979	14.0	15.2	15.5	14.8	15.4	13.9	11.9	11.8	13.3	15.1	15.8	15.3	14.3
1980	15.8	14.7	13.7	12.8	12.8	11.9	12.0	12.6	15.0	15.7	17.1	19.1	14.4
1981	18.4	17.7	16.3	17.1	19.8	19.8	20.1	21.8	22.4	23.1	26.6	28.5	21.0
1982	28.2	24.6	23.7	23.4	21.9	18.6	15.9	15.1	14.4	13.9	13.9	13.3	18.9
1983	12.8	11.8	14.0	15.4	14.6	14.3	14.3	14.2	14.5	15.8	16.2	16.0	14.5
1984 2/	16.5	18.4	19.0	18.2	18.4	16.4	15.5						
BEEF-STEER/CORN, Omaha 3/													
1979	27.8	28.9	29.1	29.4	29.0	30.0	27.2	26.6	26.6	25.1	24.3	23.1	27.3
1980	21.3	19.5	19.5	19.1	19.3	19.4	20.0	20.6	21.4	21.5	23.8	26.0	21.0
1981	25.2	25.0	25.0	24.6	25.9	26.5	26.5	27.2	26.5	26.1	29.2	27.5	26.3
1982	27.7	25.1	25.2	24.5	23.4	22.7	21.9	21.8	21.2	19.6	18.1	17.8	22.4
1983	18.4	18.3	19.8	21.6	22.1	21.1	20.4	19.7	19.1	20.4	20.7	21.3	20.3
1984 2/	22.4	24.6	25.6	24.8	24.1	22.2	21.5						
MILK/FEED, U.S. basis 4/													
1979	1.55	1.59	1.54	1.54	1.56	1.56	1.55	1.53	1.50	1.48	1.42	1.40	1.52
1980	1.43	1.40	1.39	1.39	1.39	1.41	1.39	1.35	1.36	1.40	1.43	1.48	1.40
1981	1.53	1.56	1.54	1.55	1.53	1.53	1.51	1.46	1.47	1.47	1.50	1.57	1.52
1982	1.61	1.62	1.60	1.59	1.56	1.55	1.49	1.45	1.43	1.45	1.41	1.36	1.51
1983	1.39	1.36	1.34	1.33	1.33	1.33	1.32	1.32	1.31	1.34	1.39	1.48	1.35
1984 2/	1.56	1.62	1.59	1.58	1.57	1.55	1.52						
EGG/FEED, U.S. basis 5/													
1979	6.1	6.8	7.3	6.6	6.0	6.4	6.0	5.[illegible]	5.6	5.7	6.0	6.2	6.1
1980	5.7	6.0	6.6	5.9	5.7	5.6	5.9	5.2	5.2	5.5	5.8	6.4	5.8
1981	6.5	7.2	6.7	6.6	6.8	7.1	6.6	5.6	5.3	5.7	5.4	6.0	6.3
1982	6.3	6.3	6.0	5.7	5.8	6.1	5.8	6.0	5.8	5.7	6.1	6.0	6.0
1983	6.2	6.9	7.6	8.8	8.6	7.4	8.5	6.4	5.8	5.7	5.8	5.9	7.0
1984 2/	5.7	6.5	6.2	5.5	5.6	6.2	5.7						
BROILER/FEED, U.S. basis 6/													
1979	2.2	2.6	2.7	2.8	2.6	2.5	2.3	2.6	2.6	3.3	3.0	2.9	2.7
1980	2.8	2.5	2.5	2.6	2.6	2.6	2.3	2.4	2.6	2.6	2.5	2.4	2.5
1981	2.4	2.4	2.3	2.6	2.6	2.6	2.5	2.6	2.7	2.6	2.5	2.6	2.5
1982	2.5	2.5	2.5	2.6	2.7	2.4	2.3	2.4	2.6	2.8	2.8	2.7	2.6
1983	2.5	2.8	2.8	3.0	3.1	3.1	2.8	2.7	2.7	3.0	2.7	2.9	2.8
1984 2/	2.7	2.8	2.6	2.8	2.8	2.8	2.8						
TURKEY/FEED, U.S. basis 7/													
1979	3.9	4.5	4.3	3.8	3.6	3.5	3.4	3.1	3.1	3.5	3.5	3.7	3.7
1980	4.0	3.9	3.5	3.1	3.1	3.2	3.0	3.0	3.3	3.3	3.2	3.1	3.3
1981	2.8	3.1	2.9	3.0	3.0	3.0	3.0	2.9	3.2	3.4	3.5	3.8	3.1
1982	3.9	3.9	3.0	2.9	2.9	2.9	2.7	2.9	3.0	2.8	2.8	3.0	3.0
1983	3.0	3.1	3.5	3.6	3.2	3.3	3.4	3.3	3.3	3.6	3.8	3.9	3.4
1984 2/	4.4	5.1	5.5	4.8	3.9	3.7	3.8						

1/ Bushels of corn equal in value to 100 pounds of hog, live weight.
2/ Preliminary.
3/ Based on price of choice beef-steers, 900-1,100 pounds.
4/ Pounds of 16 percent mixed dairy feed equal in value to 1 pound whole milk.
5/ Pounds of laying feed equal in value to 1 dozen eggs.
6/ Pounds of broiler grower feed equal in value to 1 pound broiler, live weight.
7/ Pounds of turkey grower feed equal in value to 1 pound turkey, live weight.

Source: Agricultural Prices, Crop Reporting Board, USDA.

Table 14.--Price trends, selected feeds, and corn products

Item	Unit	Oct.-Sept. 1983/84 1/	1984 Nov.	1984 Dec.	1985 Jan.	1985 Feb.	1985 Mar.	1985 Apr.
WHOLESALE, MOSTLY BULK 2/								
Soybean meal, 44% solvent, Decatur	$/ton	188	135	137	135	125	126	118
Soybean meal, high protein, Decatur	"	203	150	151	147	137	138	129
Cottonseed meal, 41% solvent, Memphis	"	192	102	119	110	106	89	83
Linseed meal, 34% solvent, Minneapolis	"	140	100	106	107	94	84	80
Peanut meal, Southeast mills	"	209	143	140	*	*	*	*
Meat meal, Ill. prod. pts. 3/	"	205	174	174	176	173	146	126
Fishmeal, 65% protein, East Coast	"	368	309	308	309	291	281	280
Gluten feed, Illinois pts.	"	109	80	81	80	74	62	60
Gluten meal, 60% protein, Illinois pts.	"	260	216	240	232	216	204	191
Brewers' dried grains, Milwaukee	"	113	63	78	86	61	46	47
Distillers' dried grain, Lawrenceburg, Ky.	"	170	97	93	94	96	94	87
Feather meal, Arkansas Pts.	"	246	166	175	163	150	107	104
Wheat bran, Kansas City	"	95	74	85	70	63	56	61
Wheat middlings, Kansas City	"	95	74	85	70	63	56	61
Rice bran, f.o.b. mills, Arkansas	"	82	61	71	91	74	54	44
Hominy feed, Ill. pts.	"	108	77	79	81	74	70	79
Alfalfa meal, dehy., Kansas City	"	129	117	115	111	105	95	94
Cane molasses, New Orleans	"	67	50	50	50	50	50	50
Molasses beet pulp, Los Angeles	"	124	124	125	130	130	125	126
Animal fat, Ill. prod. pts. 3/	c/lb.	17.4	19.7	18.0	17.3	18.1	17.0	17.0
Urea, 42% N., Fort Worth	$/ton	214	222	222	222	222	222	222
Corn, No. 2 white, Kansas City	$/bu.	4.70	3.95	3.92	3.72	3.33	3.15	3.11
PRICES PAID, U.S. BASIS 4/								
Soybean meal, 44%	$/cwt.	14.36	11.60	11.30	11.10	11.00	10.60	10.30
Cottonseed meal, 41%	"	15.68	13.50	12.90	12.60	12.30	12.20	11.90
Wheat bran	"	10.42	9.98	9.90	9.89	9.81	9.72	9.54
Wheat middlings	"	9.93	9.51	9.34	9.25	9.13	9.18	8.88
Broiler grower feed	$/ton	239	220	215	219	215	214	207
Laying feed	"	213	190	187	189	189	186	186
Turkey grower feed	"	254	225	220	216	216	220	214
Chick starter	"	238	219	210	210	209	209	206
Dairy feed, 16%	"	197	177	176	177	174	172	171
Beef cattle concentrate, 32-36% protein	$/cwt.	12.92	11.30	11.20	11.30	11.00	10.90	10.50
Hog concentrate, 38-42% protein	"	15.75	13.30	13.10	13.00	12.90	12.50	12.30
Stock salt	"	6.35	6.25	6.26	6.57	6.58	6.50	6.52
CORN PRODUCTS, WHOLESALE 5/								
Corn meal, New York								
White	$/cwt.	19.89	14.76	14.75	14.92	15.96	18.59	18.54
Yellow	"	14.31	12.76	12.75	12.92	13.22	13.60	13.54
Grits (brewers'), Chicago	"	11.36	10.11	9.76	9.93	10.22	10.60	10.54
Syrup, Chicago West	c/lb.	13.35	10.86	10.31	10.31	10.31	11.25	11.25
Sugar (dextrose), Chicago West	"	24.22	24.75	24.75	24.76	22.55	22.00	22.00
High-fructose (dried weight in tank cars), Chicago West	"	20.06	18.38	18.38	17.96	17.96	17.96	17.96
Corn starch, f.o.b. Midwest	$/cwt.	13.51	14.55	13.80	14.09	14.09	14.09	12.56

1/ Preliminary. 2/ Grain and Feed Market News, AMS, USDA, except urea which is from Feedstuffs, Miller Publishing Co., Minneapolis, Minnesota. 3/ Kansas City prices beginning January 1985, Illinois Products Points no longer reported. 4/ Agricultural Prices, SRS, USDA. 5/ Milling and Baking News, Kansas City, Missouri, except starch which is from industry sources. *No longer reported.

Table 15.--Consumption of feed by kind of livestock, 1977-84

Year beginning October 1	Concentrates							Roughages	
	Feed grains 1/	All grains 2/	High protein 3/	Other feed 4/	Total concentrates	Corn	Soybean meal 5/	Hay	Other harvested roughage 6/
	Million metric tons								
Dairy animals									
1977	21.2	21.9	2.2	4.3	28.6	16.3	1.4	38.2	58.9
1978	22.8	23.3	2.2	4.3	29.8	18.7	1.3	42.6	59.2
1979	22.9	25.6	2.2	1.3	29.1	18.7	1.4	40.2	58.2
1980	21.9	22.1	1.9	4.4	28.4	16.8	1.5	37.6	46.3
1981	22.7	23.2	2.5	3.9	30.1	18.9	1.5	46.2	53.9
1982	24.6	25.3	2.5	4.4	32.2	19.8	1.6	48.7	40.9
1983	23.0	24.5	2.3	4.3	31.1	17.8	1.5	48.4	36.5
1984 7/	23.0	23.8	2.1	4.0	30.0	18.0	1.7	NA	NA
Cattle on feed									
1977	28.7	30.9	1.2	2.5	34.6	21.0	1.0	12.2	5.9
1978	31.2	32.5	1.2	2.8	36.5	22.4	.9	26.5	10.8
1979	28.5	29.0	1.1	2.1	32.2	21.3	.8	25.7	10.7
1980	22.1	22.1	.7	2.7	25.5	17.8	.6	28.1	10.8
1981	23.9	24.8	.9	1.9	27.6	17.9	.8	28.3	10.6
1982	27.1	28.8	1.1	2.0	31.9	19.9	.9	32.7	11.0
1983	22.1	27.9	.9	2.0	30.8	16.0	.6	27.5	8.4
1984 7/	26.2	28.3	1.9	1.0	31.1	18.2	.8	NA	NA
Other beef cattle									
1977	7.1	7.3	1.3	3.0	11.6	5.5	1.4	57.0	71.3
1978	7.9	8.0	1.3	2.5	11.8	6.1	1.2	64.4	72.7
1979	7.1	7.1	1.3	2.7	11.1	5.7	.8	55.5	65.6
1980	6.9	6.9	1.2	2.4	10.5	5.7	.8	56.9	52.4
1981	7.6	7.7	1.4	2.2	11.3	6.1	.8	71.6	70.5
1982	7.2	7.4	1.3	2.2	10.9	5.7	.9	75.1	58.1
1983	6.7	7.2	1.2	2.1	10.5	5.5	.9	72.6	50.8
1984 7/	5.0	6.3	.9	1.5	8.7	5.0	.7	NA	NA
Hens, pullets, and chickens raised									
1977	11.8	13.3	3.5	2.4	19.2	8.9	2.7	--	--
1978	13.4	14.4	3.5	2.4	20.3	10.0	2.6	--	--
1979	14.2	15.0	3.9	1.8	20.7	11.0	2.8	--	--
1980	13.7	14.3	3.3	2.6	20.2	9.9	2.6	--	--
1981	14.2	15.3	3.8	2.1	21.2	11.0	2.7	--	--
1982	12.8	13.4	3.5	2.7	19.6	9.9	2.9	--	--
1983	11.2	12.7	2.9	2.2	17.6	8.5	2.7	--	--
1984 7/ 8/	6.6	7.6	1.9	1.3	10.8	5.1	1.6	--	--
Broilers									
1977	7.5	7.8	3.7	.8	12.3	7.1	2.8	--	--
1978	9.3	9.6	4.1	.7	14.4	8.9	3.0	--	--
1979	9.7	9.9	4.3	.9	15.1	9.3	3.2	--	--
1980	10.1	10.3	4.3	.8	15.4	9.8	3.3	--	--
1981	10.9	11.2	4.9	.8	16.9	10.4	3.3	--	--
1982	10.6	11.0	4.8	.8	16.7	10.1	3.5	--	--
1983	10.0	10.8	4.5	.8	15.8	9.5	3.4	--	--
1984 7/ 8/	10.6	11.2	4.9	2.3	18.3	10.2	3.8	--	--

Continued--

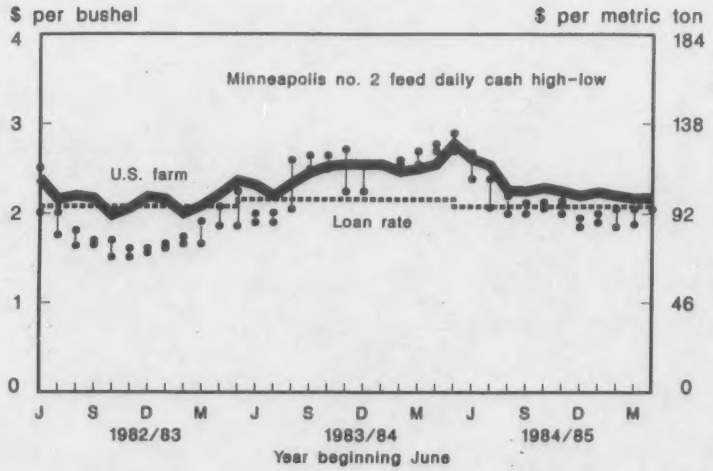
Table 15.--Consumption of feed by kind of livestock, 1977-84--Continued

Year beginning October 1	Concentrates							Roughages	
	Feed grains 1/	All grains 2/	High protein 3/	Other feed 4/	Total concentrates	Corn	Soybean meal 5/	Hay	Other harvested roughage 6/
	Million metric tons								
Turkeys									
1977	2.1	2.3	1.7	.3	4.3	1.8	1.0	--	--
1978	2.5	2.7	1.8	.3	4.8	2.2	1.3	--	--
1979	2.6	2.8	1.9	.3	5.0	2.4	1.3	--	--
1980	2.7	2.8	1.8	.4	5.0	2.4	1.3	--	--
1981	2.8	3.0	2.0	.2	5.3	2.5	1.2	--	--
1982	2.8	3.1	2.0	.3	5.4	2.5	1.8	--	--
1983	2.6	2.9	1.8	.4	5.1	2.3	1.3	--	--
1984 7/	2.7	3.1	2.0	.6	5.7	2.4	1.6	--	--
Hogs									
1977	34.7	35.6	5.8	2.2	43.6	34.5	4.6	--	--
1978	43.0	43.6	6.2	2.4	52.2	40.1	5.4	--	--
1979	46.0	46.5	6.9	2.1	55.5	43.3	6.0	--	--
1980	40.0	40.1	5.4	2.3	47.8	38.0	4.9	--	--
1981	38.4	38.9	5.6	1.8	46.3	36.1	5.2	--	--
1982	37.9	38.6	5.6	1.9	46.1	35.6	5.4	--	--
1983	34.9	35.8	5.1	1.9	42.8	32.6	4.4	--	--
1984 7/	36.7	37.6	5.2	2.4	45.2	34.5	5.1	--	--
Other livestock and unallocated									
1977	5.2	5.3	1.1	1.4	7.8	2.1	.6	10.0	5.4
1978	6.0	6.1	1.1	1.2	8.4	1.8	.6	9.4	4.7
1979	6.8	7.0	1.6	1.4	10.0	3.1	.8	10.3	5.1
1980	5.7	5.8	1.1	1.0	7.9	2.6	.6	9.3	5.3
1981	6.7	6.9	1.7	1.5	9.8	3.1	.6	11.6	5.1
1982	16.3	16.6	1.2	2.5	20.3	11.4	.6	11.9	5.0
1983	9.6	9.7	1.7	1.7	7.7	2.8	.7	11.6	5.2
1984 7/	8.6	8.5	3.7	1.6	14.0	3.7	1.7	NA	NA
All livestock and poultry									
1977	118.5	124.7	20.5	16.9	162.1	95.1	14.8	128.0	155.5
1978	136.1	140.2	21.3	16.7	178.2	109.8	15.8	131.0	134.6
1979	138.0	140.6	23.0	15.2	178.8	114.8	17.1	131.6	140.6
1980	123.0	124.5	19.8	16.5	160.8	105.1	15.7	134.7	114.8
1981	127.9	131.8	22.5	14.1	168.4	106.0	15.8	173.3	140.1
1982	139.4	145.0	22.8	15.1	182.9	114.9	17.0	168.5	115.0
1983	116.7	128.1	20.6	14.5	161.4	94.4	15.5	160.2	100.9
1984 7/	119.4	126.4	22.6	14.7	163.8	97.1	17.0	NA	NA

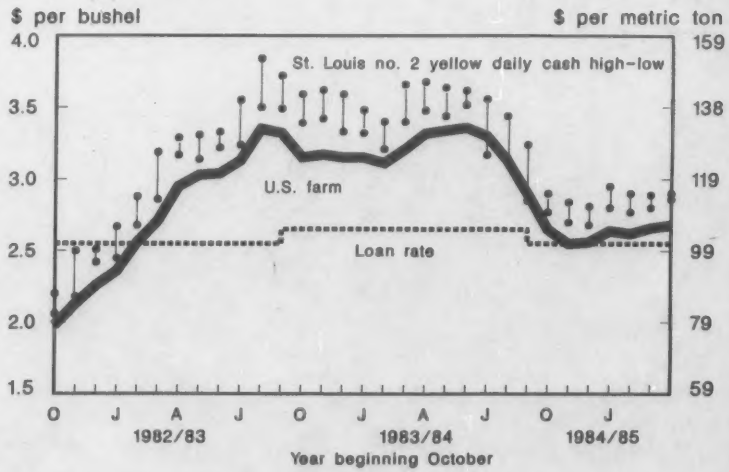
1/ Corn, sorghum, oats and barley. 2/ Feed grains, wheat and rye. 3/ Oilseed meals, animal and grain proteins. 4/ Dry milling byproducts, fats and oils, alfalfa meal, molasses, screenings, salt, minerals and urea. 5/ 44 percent crude protein content. Soybean meal consumption reflects adjustments for crude protein levels and net supply used for feed. 6/ Silage, beet pulp and straw. 7/ Preliminary. 8/ Beginning 1984 broiler breeder feed will be included in broilers feed. NA = Not available.

LIST OF TABLES

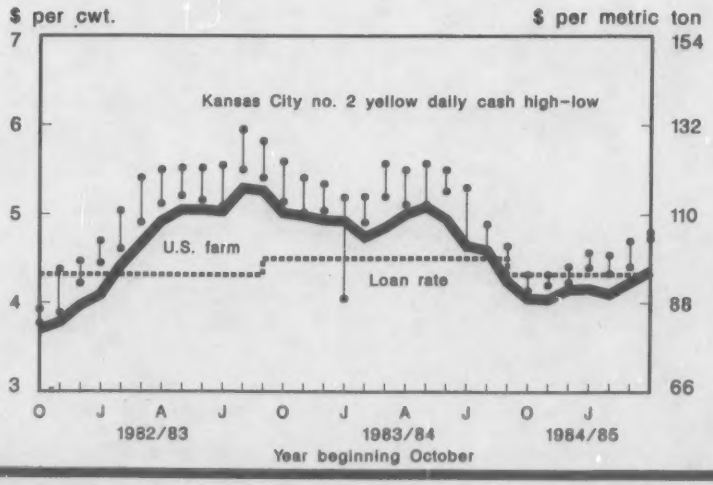
Barley Prices



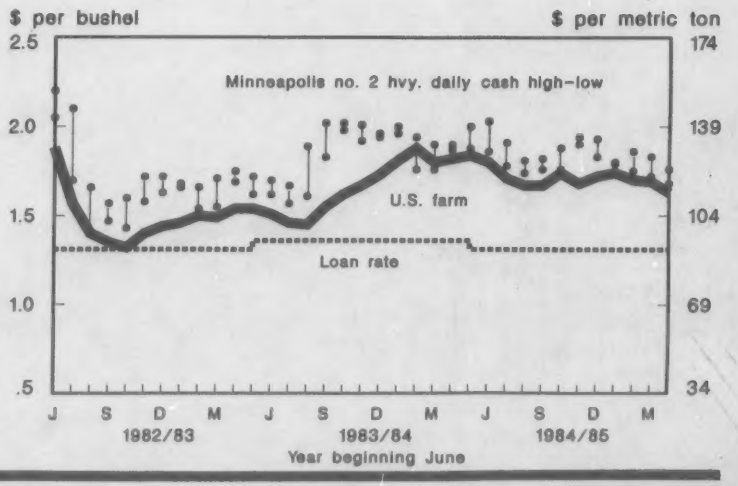
Corn Prices



Sorghum Prices



Oat Prices



UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

Moving? To change your address send this sheet with label intact, showing new address, to EMS Information, Rm.400-GHI, USDA, Washington, D.C. 20250.

Postage and Fees Paid
United States
Department of Agriculture
AGR-101

FIRST CLASS